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THE IRON TRADE REVIEW

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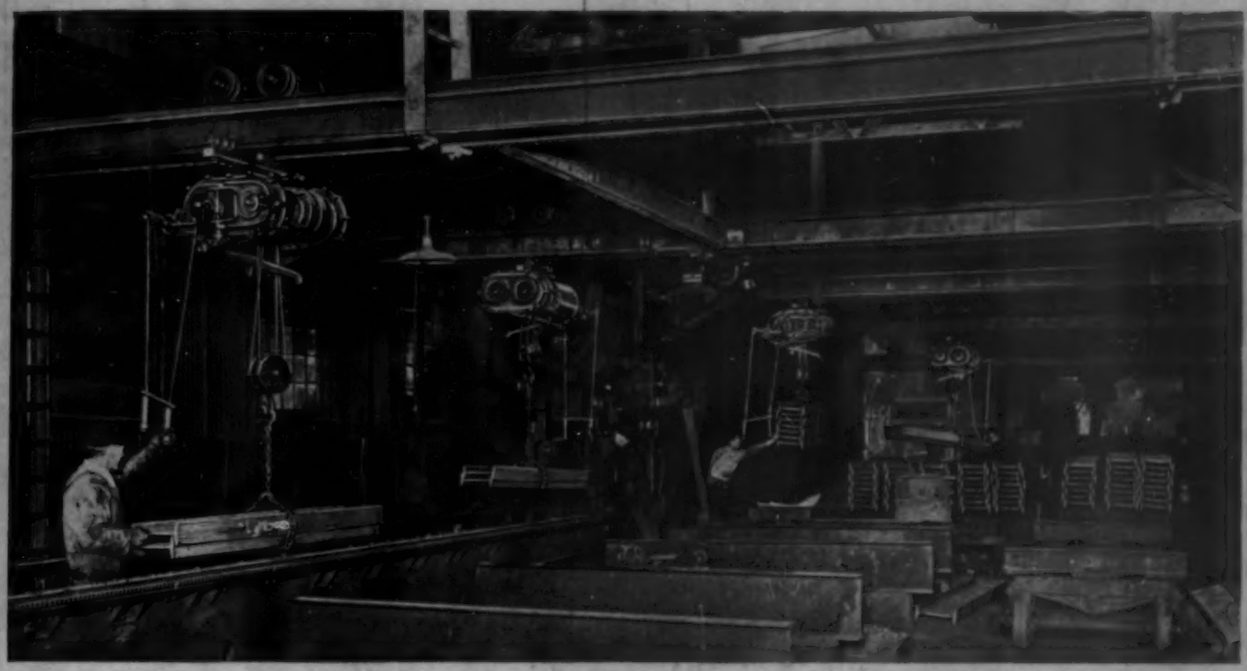

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THE CARBONIZATION OF COAL

AN ART REACHING ITS HIGHEST ATTAINMENT THROUGH KOPPERS PRACTICE

THE KOPPERS COMPANY

PITTSBURGH, PA.

Designers and Builders of BY-PRODUCT COKE PLANTS

Say you saw it in THE IRON TRADE REVIEW

THE IRON TRADE REVIEW

Vol. LXVI Cleveland, March 25, 1920 *No. 13*

Market's Course More Orderly

With New Buying Restricted, Prices Show More Settled Condition—Filling of Present Orders, Chief Problem—Higher Prices Expected to Follow Lifting of Coke Regulation—German Steel Districts Prostrate from Revolution

NEW buying of iron and steel clearly is in considerably reduced volume and prices, as a consequence, continue to follow a more orderly course. The feverish spot buying having subsided, there is nothing about the situation that merits the description of weakness. With producers on all sides well filled with orders and deliveries kept under check by operating and transportation difficulties, the chief problem for the industry is the discharge of present obligations. Mill shipments are rising but the recovery is slow and the necessity for the piling of finished material in various districts has not yet been overcome.

Plates reflect the more settled basis of prices. Eastern makers who recently were refusing much tonnage now are more disposed to welcome bookings. The open market quotation on plates is more stable around 4.00c, Pittsburgh. Steel bars, which are scarce, are about on the same level. The available supply of black and galvanized sheets is exceedingly limited with large premiums for prompt delivery still prevailing. The leading wire maker which recently took on some business for the future with prices to be fixed at delivery has dropped this plan, and has reverted to the former minimum quotations. April settlements for open-hearth sheet bars under term contracts by a large independent seller in northern Ohio will be on the basis of $80, Youngstown. This compares with $65 in March. Offers of $95 for prompt bars are reported this week.

More Buying of Iron

The pig iron market while in no sense weaker shows more fluctuations in prices, indicating that the advance has been too rapid in some districts. A Buffalo maker is booking for last half at $43, base, or $2 less than the top figure recently asked there by the furnaces. On the contrary, eastern Pennsylvania producers have withdrawn anything below $44, furnace, for last half. The valley market is steady. The belief is being expressed in some quarters that another buying movement is not far distant. The signs along this line are most noticeable in the Chicago district where inquiry has broadened out. Sales of the week have totaled 30,000 tons. Eastern Pennsylvania reports fair sales.

Output Lost in Germany

Though Germany has not been exporting actively, the revolution in that country is something of a factor in the world's iron and steel markets. The correspondent of THE IRON TRADE REVIEW at Dusseldorf cables that the principal Westphalian district is completely idle. The loss of at least a month's production is reported unavoidable. Against this shrinkage of output comes the report from Great Britain of an intensified demand from the continent. It is declared British makers could sell 10 times their present pig iron exports. The American market on both iron and steel continues to be sounded by British buyers. Pending foreign pig iron inquiries total over 125,000 tons. A few sales have been made including 2000 tons of bessemer to Italy by an eastern Pennsylvania maker at $46, furnace, but metal is scarce. Italy wants one lot of 15,000 tons. The Orient still is the most active foreign market. China has inquired for 20,000 tons of rails. The leading independent export agency has opened its books for third quarter business.

Lifting of the government restrictions on coal and coke, effective April 1, has met with some difference of opinion as to the market effect. Those who are predicting much higher prices in the next 30 to 60 days, and they are in the majority, point to the sharp premiums which recently were obtained where government regulations were not strictly observed. There is a feeling, however, that the freedom of the coal and coke markets will be probationary and that any extreme advances will bring about a speedy restoration of federal control.

High Prices a Factor

While some work undeniably is being held back by high prices the week's structural contracts have been of good size, totaling at least 25,000 tons. The delay in railroad car and equipment awards is ascribed both to financing problems and to difficulties in obtaining steel. Present quotations on box cars are around $3600 each as compared with a price of $800 before the war. The American Car & Foundry Co. has closed for 1500 cars with a western road requiring about 10,000 tons. Inquiries for about 30,000 cars remain unplaced.

MARCH 25, 1920

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metal-working Industries

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A Code for Labor Adjustment

IN ONE of the most thoughtful and comprehensive studies from a national standpoint of the relations between employer and employed ever prepared in this country, the report of the second conference called by President Wilson, presents a complete framework of procedure for the promotion of industrial tranquility. The outstanding feature of the report is the extent to which the members of the conference have endeavored to define certain principles as fundamental to the solution of the problem and to declare for concrete recommendations looking toward the carrying out of these controlling considerations. Along that line the indorsement by the conference of the principles of collective bargaining and of the employe representation plan are among its most notable utterences.

The conclusions of the conference revolve about two main lines of thought. "Prevention of disputes is worth more than cure" is proclaimed to be the actuating motive for the approval given to the representative form of plant organization which it is believed should lead to the greater democratization of industry and more amicable relations between employer and employe. The second central idea adopted by the conference provides for the voluntary settlement of disputes. This is to be effected through specific machinery set up with governmental backing and by a minimum of regulation. The system through which it is hoped to bring about the adjustment of disputes and to preserve production in the pending interval is provided by a national industrial board of nine members and by regional conferences or boards of inquiry. Public sentiment is counted upon to enforce the acceptance of such findings wherever it is necessary that they shall be rendered. No compulsory arbitration is provided. The freedom of labor to organize is defended and its right to strike is not denied. Likewise the policy of the closed or open shop is not made a matter for arbitration.

The opposition of President Gompers as the spokesman of organized labor to the principles set up by the conference is significant. The main point of his displeasure as may have been expected, is the indorsement of the shop representation plan. Organized labor already is on record against this system and for reasons that are perfectly plain and consistent. The underlying aim of the representation plan is the democratization of industry with the shop made the distinct and supreme unit; the American Federation of Labor embodies the very antithesis of this plan since it makes the union supreme over the interests of the individual or the shop. The latter stands for an autocracy in industry and for control from without as opposed to control from within. It approves and demands collective bargaining but collective bargaining of its own restricted kind. Mr. Gompers' strictures of a proposal for labor adjustments which manifestly has much in it of advantage to the labor unions will not meet with favor from intelligent men who are earnestly seeking a solution of a great problem.

The report of the conference is far from being a perfect instrument. It provides no assured means of strict enforcement either of agreements reached under any system of collective bargaining or of the findings that may be made by the national conference board or the regional bodies. Much is left to faith and to public opinion. Its machinery for the creation of these mediation and adjustment boards seems rather unwieldy and uncertain and offers the possibility of government authority being used as a lever for the extension of unionism such as proved to be the case with the war labor board. At best it is largely a declaration of principles designed to meet a present-day set of conditions which, it is pointed out, may so change in the future as to render the remedies proposed unnecessary or inapplicable. But as a declaration of principles, it provides a code of accepted judgments which should aid materially in marshalling and crystallizing public opinion on questions relating to the relations of

employer and employed. Probably that is the most effective thing which the conference could have hoped to accomplish.

Coke Plants Here and Abroad

AFTER spending three months in studying the design, construction and operation of by-product coke ovens in the principal industrial centers of Europe, an engineer who has been closely identified with the cokemaking industry in the United States declares that in the more important details of construction and operation, coke plants in America are superior. In an article appearing elsewhere in this issue, he qualifies this statement by explaining that the European plants excel only in architectural beauty and painstaking attention given to minute detail. In ruggedness, strength and reliability of equipment, arrangement of units, and economy of operation, the American plants are said to be distinctly superior.

To those who are familiar with the chief characteristics of European and American engineering practice, the facts revealed by this comparison are not surprising. It is well known that on the far side of the Atlantic much attention is paid to beauty of design and refinement of detail. This probably explains why the floors and walls of European plants are smoothly finished and why piping and similar work receives more care in construction than is exercised in American plants.

While it is easily understood why European engineers go to extremes in this respect, even to the extent of sacrificing efficiency, it is difficult to explain why they have needlessly duplicated machinery as is clearly indicated in the article. According to the author, European practice frequently calls for six batteries of ovens, three conveyors and three screening stations whereas in America a single battery, one conveyor and one screening station would suffice. Moreover, the coking time of ovens in the United States averages only about 60 per cent of the normal coking time for ovens of the same average width in Europe. The American advantage in this respect undoubtedly can be attributed to the fact that the coke industry in this country, as in the case of many other lines of manufacturing, has been developed to meet the demand for heavy production.

Cokemakers on this side of the Atlantic probably will be gratified to know that their equipment and methods make such a creditable showing in comparison with that of their European contemporaries. However, before resting too complacently upon the evident superiority, they will do well to thoroughly investigate the advantages of European practice. The tendency in England and on the continent to expend time and money on structural beauty and thoroughness in detail has some points of merit which should be adopted in the United States. While it would be a mistake to sacrifice economy and output for greater refinement, the average American by-product plant undoubtedly can effect a reduction in operating expenses by devoting more attention to the details in which the European plants are superior.

Exporters Are Embarassed

EXPORTERS have been extremely apprehensive of the trade outlook for some time, but not so much so as during the past few weeks. The decline in exchange some time back brought them up against a sharp obstacle, but apparently their difficulties only have increased since the partial recovery of international money values. The exchange recovery is due, it is generally believed to the announcement that the Anglo-French loan would be paid at maturity thus restoring confidence in European solvency. Exports and imports as yet have not reflected any considerable falling off of trade. February export of all kinds were valued at $646,000,000 which while the lowest since October was only about 11½ per cent less than January. Imports in February also dropped to $467,000,000 or not quite 2 per cent over the preceding month.

While steel and its products constitute a goodly share of the business done by the export houses, these establishments are also dependent upon their sale of other American commodities as well. But today the steel industry is not capable of supplying the exporters with the volume of material it was a year ago. The United States Steel Corp. sells to foreign customers through the United States Steel Products Co., and a group of the larger independents are selling now through the Consolidated Steel Corp. The American lumber producers also have their own export combinations, and foreign customers are being served by similar instrumentalities in copper, textiles, paper, cement, chemicals, phosphate, magnesia, tanning, office equipment and other lines. Export organizations under the Webb law are being formed to handle coal, electrical supplies, hosiery, builders' hardware, packing, furniture, steel specialties, musical instruments, railroad supplies, machine tools, stoves, machinery, carpets and rugs, paints, tanning, converters, etc.

These export combinations are setting up new agencies owned by the producers themselves to handle their foreign business. Naturally they detract from the volume of production which independent export houses or international merchants have at their disposal. They restrict the business that will be done through these channels and consequently are adding to the embarassment of the old line export houses.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 958 AND 962

Pig Iron

Bessemer, valley	42.00
Bessemer, Pittsburgh	43.40
Basic, valley	43.00
Basic, Buffalo	41.00 to 43.00
Basic, Pittsburgh	44.40
Basic, delivered, eastern Pa.	42.50 to 43.50
Malleable, valley	43.00
Malleable, Pittsburgh	44.40
Malleable, Chicago, furnace	43.50
Malleable, Buffalo, furnace	46.25
Malleable, delivered eastern Pa.	46.00 to 47.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$47.10 to 49.10
No. 1X, Buffalo	46.00 to 48.00
No. 1 foundry Chicago, furnace	45.25
No. 2 foundry, valley	42.00 to 43.00
No. 2 foundry, Pittsburgh	43.40 to 44.40
No. 2 foundry, Buffalo	43.00 to 45.00
No. 2 foundry, Buffalo, Boston del.	47.90 to 48.90
No. 2X, Buffalo, Boston del.	49.15 to 50.15
No. 2 foundry, Chicago furnace	43.00
No. 2 foundry, Ironton furnace	42.00 to 44.50
No. 2 foundry, Cleveland furnace	43.00
No. 2X, eastern, del., Phila.	45.90 to 47.35
No. 2X, eastern, N. J., tidewater	46.35 to 47.35
No. 2X, Pennsylvania, Boston del.	47.65 to 48.15
No. 2 foundry, Pa., Boston del.	46.40 to 46.90
No. 2X, foundry, Buffalo furnace	44.25 to 46.25
No. 2 foundry, del., Philadelphia	44.90 to 46.10
No. 2 foundry, N. J., tidewater	45.10 to 46.10
No. 2 southern, Birmingham	38.00 to 42.00
No. 2 southern, Cincinnati	43.60 to 45.60
No. 2 southern, Chicago	45.00
No. 2 southern, Phila.	43.50 to 44.50
No. 2 southern, Cleveland	45.00 to 47.00
No. 2 southern, Boston	50.00
No. 2 southern, St. Louis	44.30 to 47.35
No. 2X, Virginia, furnace	43.25
No. 2X, Virginia, Philadelphia	47.35
No. 2X, Virginia, Jersey City	47.65
No. 2X, Virginia, Boston	47.95
Gray forge, valley, Pittsburgh	42.40
Gray forge, eastern Pa.	43.00 to 43.50
Silveries, 8%, furnace	53.00 to 55.00
Ohio Silveries, 8%, Chicago	56.30
Tennessee Silveries, 8%, Chicago	56.30
Low phos. standard, Phila.	53.80
Low phos. Lebanon, furnace	47.00
Low phos. stan. valley del., Pitts.	50.40
Charcoal, Superior, base, Chicago	57.50

Coke

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$180.00 to 230.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	175.00
Spiegel, 18 to 22 per cent furnace spot	60.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	85c to 1.00
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	19c to 20c
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	6.25 to 7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	62.50 to 64.50
Bessemer, ferrosilicon, 11 per cent	65.80 to 67.80
Bessemer, ferrosilicon, 12 per cent	69.10 to 71.10

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	70.00 to 75.00
Open-hearth, Youngstown	65.00 to 70.00
Open-hearth, Philadelphia	64.10
Bessemer, Pittsburgh	65.00 to 70.00
Bessemer, Youngstown	65.00 to 70.00
Forging, Pittsburgh	75.00 to 80.00
Forging, Philadelphia	79.10 to 84.10

SHEET BARS

Open-hearth, Pittsburgh	$80.00 to 90.00
Open-hearth, Youngstown	80.00 to 90.00
Bessemer, Pittsburgh	70.00 to 80.00
Bessemer, Youngstown	70.00 to 80.00

SLABS

Pittsburgh and Youngstown	65.00 to 70.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$70.00 to 75.00
Grooved skelp, Pittsburgh	3.25c to 4.00c
Sheared skelp, Pittsburgh	3.45c to 4.00c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	3.10c to 4.00c
Structural shapes, Philadelphia	2.70c to 4.25c
Structural shapes, New York	2.72c to 4.27c
Structural shapes, Chicago	2.72c to 2.97c
Tank plates, Pittsburgh	2.65c to 4.00c
Tank plates, Chicago	2.92c to 3.17c
Tank plates, Philadelphia	2.90c to 4.25c
Tank plates, New York	2.92c to 4.27c
Bars, soft steel, Pittsburgh	3.00c to 4.00c
Bars, soft steel, Chicago	2.62c to 2.87c
Bars, soft steel New York	2.62c to 4.27c
Bars, soft steel, Philadelphia	2.60c to 4.25c
Bar iron, common, Phila.	3.75c to 4.25c
Bar iron, common Chicago	3.50c to 4.00c
Bar iron, common, Cleveland	3.75c
Bar iron, common, New York	3.77c to 4.27c
Bar iron, common, Pittsburgh	4.50c
Hard steel bars, Chicago	3.50c to 4.00c

Rails, Track Material

Standard bessemer rails, mill	$45.00 to 60.00
Standard open-hearth rails, mill	47.00 to 62.00
Relaying rails, light, St. Louis	52.00 to 55.00
Relaying rails, Pittsburgh	50.00 to 55.00
Angle bars, Pittsburgh base	3.00c to 4.00c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	3.00c to 3.50c
Spikes, railroad, Pittsburgh	4.00c to 4.25c
Track bolts, Pittsburgh	6.00c to 6.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	$3.25 to 4.50
Plain wire, Pittsburgh	3.00 to 4.00
Galvanized wire, Pittsburgh	3.70 to 4.70
Barbed wire, painted, Pittsburgh	3.40 to 4.40
Polished staples, Pittsburgh	3.40 to 4.40
Galvanized staples, Pittsburgh	4.10 to 5.10
Cut nails, Pittsburgh, l. c. l.	6.195
Coated nails per count keg, Pitts.	2.85c to 3.35c
Barbed wire, galvanized, Pitts.	4.10 to 5.10

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	6.25c
Sheet piling, base, Pittsburgh	2.55c to 3.65c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 8.50c to 9.50c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 9.00c
No. 28, bessemer, Pitts.	4.35c to 9.00c
No. 28, open-hearth, Chi.	4.62c to 8.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 5.50c
No. 28, bessemer, Pitts.	4.35c to 5.50c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 9.65c
No. 28, bessemer, Pitts.	5.70c to 9.65c
No. 28, open-hearth, Chi.	5.97c to 8.92c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 7.50c
No. 10, bessemer, Pitts.	3.55c to 7.50c
No. 10, open-hearth, Chi.	3.82c to 6.77c
No. 10, open-hearth, Phila.	3.80c to 5.50c

Full sheet schedule page 962.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

	Black	Galv.
	Per cent off	
Base, Pittsburgh		
⅜ to 3 in., butt steel	54 to 57½	40½ to 44
¼ to 3 in., butt, iron	34½	18½

Full pipe schedule page 962.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	30½ to 40½
Iron, 3½ to 4½ inches, c. l.	11

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	$75.80 to 77.80
Six-inch and over, Chicago	72.80 to 74.80
Four-inch, New York	75.30
Six-inch and over, New York	72.30
Four-inch, Birmingham	69.00
Six-inch and over, Birmingham	66.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	5.00c to 5.50c
Bands, Pittsburgh	5.00c to 5.50c
Hot rolled strip steel, Pitts. stamping quality	5.50c to 6.50c
Cold finished steel bars, Pitts., base	4.00c to 5.25c

Rivets

Structural rivets, Pittsburgh	4.50c
Boiler rivets, Pittsburgh	4.60c
Rivets ½ in. and smaller, Pitts.	50 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	40–5 off
Cut thread	30–10 off
Larger and longer	30 off

MACHINE BOLTS

(⅜ x 4 inches, but pressed nuts)

Rolled thread	40–10–5 off
Cut thread	40–5 off
Larger and longer	30–10 off
Plow bolts Nos. 1, 2 and 3 heads	40 off
Other style heads	20% higher
Stove bolts in packages	70–10 off
Stove bolts in bulk	70–10–2½ off
Cold pressed semifinished hexagon nuts ½ in. and larger	60–5 off
Cold pressed semifinished hexagon nuts ⅜ in. and smaller	60–5 off
Gimlet and cone point lag screws	50 off

NUTS

Hot pressed, square blank	2.00c off
Hot pressed, square tapped	1.75c off
Hot pressed, hexagon blank	2.00c off
Hot pressed, hexagon tapped	1.75c off
Cold pressed, square tapped	1.75c off
Cold pressed, square blank	2.00c off
Cold pressed, hexagon blank	2.00c off
Cold pressed, hexagon tapped	1.75c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales, at the dates named

	Prices March 24, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Bessemer, valley, del., Pittsburgh	$43.40	$43.15	$32.00	$32.55
Basic, valley, delivered, Pittsburgh	44.40	43.65	30.40	30.35
*No. 2 Foundry, Val. del Pittsburgh	43.40	42.40	33.15	29.85
*No. 2 Foundry, Chicago, furnace	43.00	42.25	31.75	29.95
Lake Superior charcoal, Chicago	57.50	57.50	35.50	38.70
Malleable, valley	43.00	43.00	31.75	31.85
Malleable, Chicago	43.50	42.75	32.25	30.45
*Southern, No. 2, Birmingham	40.00	40.00	30.65	31.20
*Southern Ohio, No. 2, Ironton	43.00	43.00	31.75	29.95
Basic, eastern del., eastern Pa	43.00	40.50	33.00	32.85
**No. 2X, Virginia, furnace	43.25	42.75	33.40	31.65
**No. 2X, eastern del., Philadelphia	45.90	45.00	35.85	35.10
Gray forge, valley del., Pittsburgh	42.40	41.40	31.80	29.60
Ferromanganese, 80 per cent, delivered	180.00	160.00	110.00	140.00
Bessemer billets, Pittsburgh	65.00	61.25	40.85	42.25
Bessemer sheet bars, Pittsburgh	70.00	65.00	45.00	45.75
Open-hearth sheet bars, Pittsburgh	80.00	65.00	45.00	45.75
Open-hearth billets, Pittsburgh	70.00	61.25	40.85	42.25
Steel bars, Pittsburgh	3.75	3.85	2.45	2.61
Steel bars, Chicago	3.52	2.62	2.62	2.81
Iron bars, Philadelphia	4.00	3.75	2.895	3.005

	Prices March 24, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Iron bars, Cleveland	$3.75	$3.75	$3.00	$3.15
Iron bars, Chicago mill	3.80	3.44	2.73	2.86
Beams, Chicago	3.72c	2.72	3.07	2.89
Beams, Pittsburgh	3.25c	3.15	2.45	2.71
Beams, Philadelphia	4.00c	3.75	2.695	2.958
Tank plates, Pittsburgh	3.75c	3.70	2.65	2.90
Tank plates, Chicago	4.02	3.93	2.93	3.15
Tank plates, Philadelphia	4.25	4.25	2.895	3.155
Sheets, blk., No. 28, Pittsburgh	6.00c	6.00	4.35	4.60
Sheets, blue anld., No. 10, Pittsburgh	5.50c	5.50	3.55	3.80
Sheets, galv., No. 28, Pittsburgh	7.25c	7.00	5.70	5.95
Wire nails, Pittsburgh	4.00	4.20	3.45	3.45
Connellsville furnace coke	6.00	6.00	5.85	4.00
Connellsville foundry coke	7.00	7.00	6.95	4.80
Heavy melting steel, Pittsburgh	28.00	28.35	21.85	14.60
Heavy melting steel, eastern Pa.	25.25	25.75	20.80	14.25
Heavy melting steel, Chicago	25.00	25.00	20.60	15.25
No. 1 wrought, eastern Pennsylvania	35.50	36.15	27.85	24.00
No. 1 wrought, Chicago	31.50	30.75	26.50	17.65
Rerolling rails, Chicago	33.50	34.60	31.10	16.30

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Iron Market Shows More Activity

Chicago Inquiry Broadens and Sales Total 30,000 Tons—East Reports Fair Volume of Trading—Buffalo Maker Sells Last Half Tonnage at $43 Base—Eastern Pennsylvania Furnaces Advance to $44—Valley Market Steady

Chicago, March 23.—Signs are beginning to indicate a renewed buying movement after the recent comparative lull in the pig iron market, and some observers believe the end of the quarter will see much additional tonnage on furnace books. At present considerable activity is manifested on the part of melters and the aggregate of sales during the past week is fairly large, one interest having booked about 30,000 tons for last half. Included in present inquiry is one lot of 1200 tons of foundry and 600 tons of malleable, another of 3000 tons of malleable and foundry, and one of 1000 tons of malleable. Other inquiries also active call for 1200 tons, 1000 tons and 500 tons of foundry. A Wisconsin malleable interest recently covered a round tonnage, variously estimated at 8000 to 10,000 tons for last half, divided among a number of sellers on at least part of which $43.50, Chicago, was done. Some of this iron will come from other producing centers, and figured out to the same basis. One of the factors giving strength to the market is the fact that users of basic have not bought for their last half requirements, although faced by probability of heavy purchases of railway equipment which will require large tonnages of this grade. The local maker is so nearly sold out that it will not be able to handle any of this basic inquiry and other producing centers will be called on for practically the entire tonnage for western melters. The northern producer is almost sold out and is not much of a present factor. Its price is unchanged at $43, base, for 1.75 to 2.25 silicon. Southern iron is being quoted at $42, furnace, for 1.75 to 2.25 silicon, for last half by most producers, although one has taken some business quietly at $40, Birmingham, recently. While some makers of silvery iron are quoting $55, furnace, for 8 per cent, a recent sale of 500 tons to an automobile manufacturer was done at a figure believed to be $53, furnace. Low phosphorus iron is quiet, with quotations ruling at $51, furnace.

Buying in Better Volume

Philadelphia, March 23.—Fair activity characterized the pig iron market in this district the past week. One consumer bought 5000 tons of basic for last half at $42, eastern Pennsylvania furnace, and another steelmaker bought 5000 tons or part of that tonnage for last half at a higher price. An eastern Pennsylvania maker sold 2000 tons of hematite or bessemer around 0.06 phosphorus at $46, furnace, for Italy. Fair business was entered in foundry iron. A considerable tonnage is pending and new inquiry has improved. The Baltimore & Ohio railroad has closed on its inquiry. The Baldwin Locomotive Works inquiry still is pending. The Reading railroad has out an inquiry for 800 tons. The leading pipe maker bought considerable tonnage. The eastern Pennsylvania foundry iron minimum now is higher at $44, furnace for No. 2 plain (1.75 to 2.25 silicon) and considerable tonnage is being sold at $45, base. An improved inquiry is coming from New England. Practically only one Virginia maker is soliciting business. This interest is taking a limited tonnage for second half at $42.25, base. Numerous small lots malleable have been sold aggregating a fair total. Eastern Pennsylvania malleable for second half has been bought at $55.50, furnace, while some Ohio malleable for second quarter has brought considerably more. Negotiations are in progress for large tonnages of gray forge on which price views range from $42 to $44, eastern Pennsylvania furnace. There is a growing disposition to quote high prices on gray forge because off and low grade iron cannot be shipped on gray forge orders as formerly. Most consumers have government and railroad orders and hence must buy iron to meet specifications. The only development in low phosphorus is the sale of 750 tons of copper bearing now at $47, furnace. The Delaware River furnace is expected to blow in early in April. Furnace operators have received the removal of maximum prices on fuel as paving the way for higher prices.

No More Basic Sold

Pittsburgh, March 23.—While no sales of basic pig iron have been done here lately less than $43, valley furnace, no additional transactions are reported this week and some interests still are expressing doubt over the strength of the market. However there is nothing to support a current market quotation of $41 or $41.50. Out side of a moderate export inquiry for this grade practically no interest whatever is observed on the part of melters and the latter now are seemingly getting good shipments against contracts. Intimations have been heard

since a week ago that the recent tonnage of basic sold to a Pittsburgh district steelmaker for delivery over the next 60 days at $43, valley furnace, called for a specially low sulphur content. While some makers say this should have commanded a premium over the uusual 0.05 sulphur content others declare this is purely a technical claim as in either case the iron was of standard quality. Other sellers of basic at $43 Cleveland furnace to the same buyer did not take this point into account. A recent inquiry for 1500 tons of standard bessemer by a Pittsburgh foundry interest for third quarter shipment has been closed at $42, valley furnace. This price also has been done on 500 tons sold to a Cleveland casting company. An export inquiry for 2000 tons of bessemer is under negotiations at $42, valley furnace, and a couple of other export inquiries involving 4500 tons of off-bessemer are getting consideration from makers. Perhaps more activity has existed in foundry iron than in any of the other grades of pig iron. One merchant interest here reports sales amounting to about 3000 tons including one lot of 1500 tons, for delivery over the second quarter at $43 for No. 2 (1.75 to 2.25 silicon and $43.25, furnace, for iron running 2.25 ot 2.75 silicon. Another interest in the past week or so sold 6000 tons of foundry for second quarter delivery at a price equivalent to $43, valley furnace. This business appears to have given the market on foundry iron a firm foundation of $42 to $43, valley furnace. Malleable appears to be slightly easier, the most recent business reported here being 1000 tons, being standard iron of this grade at $43, valley furnace, and an interest which only a short time ago obtained $44 on this grade on small lots. Some high manganese malleable is being offered at $42 and the market appears to be quotable at from $42 to $43, on this grade. While some blast furnace interest still are known to be well off in the matter of coke supplies, the more general condition is that they are very favorably fixed as the result of the improved transportation conditions due to the milder weather the past week or so.

New England Deliveries Improve

Boston, March 22.—Despite a lack of interest in last half business, pig iron sales during the past week in Boston increased over those of the previous week. Shipments have improved, and foundrymen with supplies on hand are less than they would be otherwise. Sales made during the week have been mostly in small lots and for prompt delivery. A central Connecticut consumer bought 500 tons of eastern Pennsylvania iron (2.75 to 3.25 silicon) at $48, furnace, or $50.90, delivered, for prompt shipment. A Massachusetts consumer bought 500 tons of No. 2X eastern (1.75 to 2.25 silicon) at $44.25, furnace, or $48.15, delivered. Prices in most cases have been the same as established two weeks ago. A Buffalo furnace sold 150 tons on a basis of $45.50, furnace, for 1.75 to 2.25 silicon, or $49.40, delivered, which, however, does not indicate the present New England competitive market. Small tonnages of iron from the Virginia district are available at $46.70 in New England. Several of the large consumers have as yet placed orders for no iron beyond July 1, but most of such companies are well supplied with iron for the first half. Deliveries held up during the severe weather now are being made. It has been estimated that 75 per cent of New England's pig iron consumption for 1920 has already been contracted for, and as fully 25 per cent of the last half business is usually placed in July and August the prospect of any extensive buying movement before June seems remote. Sales in Boston for New England delivery amounted to approximately 7000 tons during the past week.

Prices Higher in East

New York, March 22.—The minimum price of $43, eastern Pennsylvania furnace, on 1.75 to 2.25 silicon foundry has been withdrawn during the past week and the lowest figure now being named on new business by eastern Pennsylvania makers is $44 for this grade. Furthermore, this price now can be done only on last half. Very little first half iron is obtainable, and in a growing number of cases sales of first half foundry are being made on the basis of $45, eastern Pennsylvania furnace, for 1.75 to 2.25 silicon. This figure also is being done in sales for second half. One eastern Pennsylvania maker during the past week has sold some moderate sized tonnages of 2.25 to 2.75 silicon, for the second and third quarters at $48, furnace, and has obtained $49 for 2.75 to 3.25 silicon for the same positions. Central Pennsylvania furnaces, although still on the basis of $42 and $43, furnace, for 1.75 to 2.25 silicon, are not eager for any business and are well sold up. Virginia furnaces are still on the basis of $42, furnace, for 1.75 to 2.25 silicon, but are not soliciting by reason of their soldup condition. No Buffalo foundry has been sold into the East during the past week as far as known.

The market generally is quiet. One large inquiry for 9000 tons for last quarter still is before the trade but is expected to be closed shortly. A large pump interest has closed for 800 tons of high-silicon foundry during the past week. Included in the business closed, is an order for 1000 tons of foundry for export to Europe, and another inquiry for 1000 tons of foundry for Europe is believed to be on the point of being closed. This business was included in the 15,000 to 30,000 tons of inquiry reported a week ago, and it is expected that some of the other inquiries included will be closed shortly.

Market Quiet But Firm

Cleveland, March 23.—Very little activity continues to prevail in the pig iron market in this district but there are no signs of weakness as producers are so well filled with business that they are indifferent whether or not they book any tonnage at this time. Some of them are inclined to believe that the present absence of buying is only temporary and that a new movement may be expected to begin in the near future, since not a few consumers still are to cover themselves on their last half requirements. One local producer who had delayed taking on its regular consumers of foundry iron for the last half has continued to make sales during the past week to these buyers, and the total amount of this business has represented 10,000 tons or more. These orders were taken on the basis of $43, Cleveland furnace for No. 2 foundry (1.75 to 2.25 silicon). Some 1000 and 2000-ton lots were included. This seller now practically has finished its activities along this line. Other producers report only small transactions during the week. One of them disposed of several carloads of foundry iron for early shipment at $43, base, at the lake furnaces. Another interest closed several hundred tons of foundry iron for last half at $42, valley furnace, for No. 2 foundry. A sale of 1000 tons of malleable for last half shipment to a consumer in western Pennsylvania was made at $43, valley furnace. This is slightly less than some sales of this grade have been made recently by this maker, but the latter have been in smaller quantity. Nothing further has developed in the basic market. An Ohio river steelmaker who was inquiring in this territory for 5000 to 10,000 tons for April-June delivery is reported to have placed this business on the basis of $42, southern Ohio furnace. Selling interests in this district still insist that their basic quotation remains not less than $43, valley. Shipments of iron are going forward freely and all furnaces are being pressed for prompt shipment of supplies against contracts by their consumers. In some cases furnace production has been slowed down somewhat because of insufficient coke supplies.

On an inquiry for 500 tons of southern iron in this territory $41.25, Birmingham, was offered by the buyer but the lowest figure that could be developed was $41.50. Offerings of southern iron at $40 for No. 2 (1.75 to 2.25 silicon) seem scarce.

Prices Appear Less Firm

Cincinnati, March 22.—Pig iron prices appear to be going through some readjustment and there is a general inclination on the part of both buying and selling interests to anticipate mild declines. This is due in a measure to a withdrawal of urgent buying demands and prospects of more liberal available supplies in the near future, if, in fact, there is not at the present time more iron on hand. It is certain that sellers are not having as much difficulty to supply the demand as they experienced a few weeks ago. Southern iron prices hold firm and inquiries that are coming into the market meet demands for the top prices recently quotable, sellers in most instances quoting $45, delivered, as the ruling price in this territory for No. 2 (1.75 to 2.25 silicon). The softening tendency is apparent in northern iron, some of which recently has been closed at $42, furnace, for No. 2 foundry, but most sellers are holding firm for higher prices. It is said that a moderate tonnage of southern Ohio iron is available around $43.50, furnace, for the base grade, and other makers in that district are holding for $44.50, furnace.

Conflicting reports are current regarding the negotiations of an Ohio

river steelmaker who recently has been in the market for 5000 to 10,000 tons of basic for April-June delivery. One report is that the business has been closed with southern Ohio makers at $42, furnace, and the other is that the business still is open. Another Ohio river steelmaker recently has been selling some basic iron from stocks which have been accumulating by reason of the congestion in finishing departments caused by car shortages.

Buffalo Iron Sells Lower

Buffalo, March 23.—The outstanding feature of the past week's market was the sale of foundry pig iron at lower than the $45 base price which has been the ruling figure in this market for some time. A Buffalo district furnace sold 4000 tons of foundry at a base price of $43 for No. 2 plain (1.75-2.25 silicon), $44.25 for No. 2X (2.25-2.75 silicon) and $46 for No. 1X (2.75-3.25 silicon). The majority of this tonnage was No. 2X grade and was sold for delivery over the last quarter. This is the first break away from the $45 price. Not only was a lower price taken for foundry, but a lower figure was done in basic in this district during the past week. A lot of 4000 tons was sold at $42 for second half delivery and 1000 tons were taken for the same delivery at $41. During the earlier part of the week it is understood some resale basic was offered here at $39, but it is said this basic really was off-grade foundry being high in phosphorus and as high as 2 per cent in silicon, and therefore not strictly basic iron. Two other furnaces in this district took between them about 3000 tons of foundry at the strictly $45 base and prices of $46.25 and $48 depending on silicon content. Inquiry seems to be stronger this week.

Southern Output Sold

Birmingham, Ala., March 23.—Sales of pig iron in the Birmingham district are about equal to the production. Such inquiry continues to be received as indicates a large tonnage of iron is needed for the last half. Quotations are not uniform, one company selling small lots at $42 for No. 2 foundry (1.75 to 2.25 silicon), while others are not making much effort to go above $40. One furnace was blown out this month, and another blown in. Three furnaces are scheduled for resumption next month, but uncertainties as to coal and coke supplies may prevent this. Local consumers are purchasing considerable iron.

Plans New Mill

Future development of the Cleveland Steel Co., Cleveland, is to be carried out on a site of 55 acres on West 117th street in that city, recently acquired by that company, but no immediate construction is contemplated. When the new plant is built it will embrace equipment which will permit the rounding out of production of various sheet sizes. At the present time the Cleveland Steel Co. is a producer only of light plates and heavy sheets. The present mill of the company is to be abandoned when the new one is built.

Coke Supplies Increase

Producers Offering Tonnages More Freely as Weather Moderates and Shipments Become More Regular—Not Inclined to Sell at $7 for Spot Cash

Pittsburgh, March 23.—The turn from the extreme scarcity of spot supplies of beehive coke appears to be at hand. Several instances lately have come to light where producers have sought the consumer, instead of the reverse as was the case recently. A merchant furnace interest with stacks in western Pennsylvania, Cleveland and western New York reports getting such free shipments on contracts that it has declined several offers of additional tonnage. The New York stack of this company, idle all winter because of the lack of fuel, is expected to be blown in at no distant date, because of the improvement in the coke supply outlook. Car placements for the Connellsville regions last week averaged at least 10 per cent higher than in any other week this year and indications are for a further increase this week. Allotments for the district yesterday was 70 per cent, and the same quota was set up today. This compares with 60 per cent and 70 per cent, respectively, for Monday and Tuesday of last week. Any decreases in car supplies are unlikely owing to the marked tendency on the railroads to keep their cars on their own lines. It is believed that the steel companies soon will be able to secure enough coal to increase the operation of their by-product plants and thus become independent of the beehive oven coke market. With the passing of this demand, it is expected that a 70 per cent car supply for coke will mean a production that might not be easily absorbed by merchant blast furnaces and the foundries. Prices remain somewhat indefinite, outside of the fact that $6, ovens, is not being done on any spot furnace coke and few operators who have any "free" tonnage are inclined to sell even at $7. A price equivalent to a ratio of 5 to 1 on valley basic pig iron is what most producers without regular consuming connections believe their coke to be worth, and some even are asking more. Observance of the fuel administration price limitations amounts to little and the tendency to ignore them has increased since former President Taft recently expressed the opinion that the government neither had the right to confiscate coal, nor fix prices of that product. Some negotiating for last half furnace coke is reported, but it has not yet progressed to a point where any definite ideas of prices may be given. Production of coke in the Connellsville regions for the week ended March 13, are estimated by The *Connellsville Courier* to have been 244,470 tons, against 238,386 tons in the previous week.

No Prompt Coke Available

Boston, March 22.—The New England Coal & Coke Co., Everett, Mass., has withdrawn from the spot market, leaving New England and nearly all the north Atlantic coast without any available prompt shipment coke. The Providence Coal & Coke Co., Providence, R. I., withdrew from the market 10 days ago with the statement that it was sold up for the year. Most of the contract business has been placed. Inquiry continues to come in from many points outside of New England. The Connellsville district has nothing whatever to offer New England and the Seaboard By-Product Coke Co., of Jersey City, N. J., has only limited supplies, barely able to take care of the business in its immediate territory. Some sales from this company have been made in Connecticut at a $9.50, Connellsville base price.

New England Maker Selling

New York, March 22.—One of the New England by-product coke makers continues to contract for foundry coke for shipment over the second half to points in this district at $11.55, ovens. No New England by-product coke, however, now is being sold for shipment prior to July 1. Some beehive foundry coke has been sold here during the past week for spot shipment at government prices, but the tonnage involved in such business is not yet of importance.

Sold at Government Price

Philadelphia, March 23.—A considerable tonnage of furnace coke has been sold in this district at the government price with provision for a sliding scale in case the government price is withdrawn.

Car Situation Clearing

Cincinnati, March 22.—The Cincinnati coke market presents a somewhat more cheerful condition, clearing up in the car situation which foreshadows increased shipments from points of production to the consumers having been in evidence during the past few days. There has been little real activity, however, as the supply of coke reaching the market has not been sufficient to meet the demand. Some of the ovens which supply this district are said to have increased their stocks materially and there appears to be every reason to believe that with normal shipping facilities conditions will greatly improve.

Southern Demand Still Heavy

Birmingham, Ala., March 23.—Coke is still in great demand, and much business could be taken if there was any certainty of filling the orders. Railroad cars are not easily obtained, while coking coal also is scarce. The Woodward Iron Co. is to put out its beehive ovens and repair part of its by-product plant, and will obtain coke produced at the plant of the Birmingham Coke & By-Products Co. The Sloss-Sheffield Steel & Iron Co. has 120 Semet-Solvay by-product coke ovens under construction at North Birmingham but these will not be ready for operation until the latter part of April.

Steel Bars Very Scarce

Leading Corporation Mill Sold Out for Year—Buyers More Complacent and Market Less Excitable Around 4.00c Pittsburgh—Iron Bars Strong

Chicago, March 23.—Soft steel bars are about the scarcest form of finished steel and with the exception of the tonnage available from the mill of the leading independent no contract bars remain for consumers in this district. This maker will apportion its remaining last half tonnage during the next month, which practically will close the bar market for the remainder of this year. The leading interest has nothing to offer, and its former quotation of 2.62c, Chicago mill, is entirely nominal, while 3.52c, Chicago, has been done on business not regarded as premium. The latter figure is much below quotations made by some eastern producers. Operating conditions are unchanged in the Chicago territory, the leading interest still having three blast furnaces cold and three banked, the same as for several weeks past. Coke production has increased somewhat recently, and it is hoped some of the banked furnaces will be rendered active before long.

In the bar iron market eastern railroads are more active than in the West and considerable iron has been sold at 4.00c, mill. In the Chicago territory the minimum is 3.50c, with much business going at 3.75c, mill, and in some special instances as high as 4.50c, mill. Western railroads are increasing their inquiry for bar iron with numerous lots of 1500 tons being asked. Most mills are filled with prompt business but are still able to give some second quarter delivery.

Hard steel bars rerolled from rails still are quoted at a minimum of 3.50c, mill, with much tonnage going at 3.75c, mill. All producers are filled to the brim and reinforced concrete builders are inquiring for much tonnage of reinforced bars in vain. An inquiry for 1000 tons recently was refused by a Chicago mill.

Sold up for Second Quarter

Philadelphia, March 23.—One maker that has been booking second quarter business in steel bars at 4.00c, practically is closed out for this position. Most of its customers have accepted their allotments. With this exception, very little commercial bar tonnage is being sold, although some forging bars are being marketed right along. One large maker which apportioned its output of bolts, nuts and rivets among its regular customers has signed up most of them, and will have no more to sell for the second quarter. The minimum on cold-rolled steel with one maker is 6.00c, at which price considerable tonnage has been booked. Demand for 8 and 10-gage plates is active, and the mills are obtaining 5.00c, plus extras.

Demand is More Active

Buffalo, March 23.—Demand for bars has picked up perceptibly but mills are not able to take any heavy tonnage. There is inquiry for several large tonnages, ranging from 1000 to 3000 tons. Small bars under 1 inch are being sought actively.

Prompt Demand Less Urgent

Pittsburgh, March 23.—While some of the makers of cold-finished steel bars are making rather urgent demand for hot-rolled bars and claim to have paid 4.25c, and even 4.50c, for prompt tonnages, the general demand for early tonnages does not appear to be quite so keen as it was recently. Apparently some of the buyers most urgently in need of supplies have been able to obtain them, while others appear a little more inclined to wait. It is reported that the leading maker now is sold well into 1921 on merchant bars, and independent companies probably have business sufficient to absorb production for at least four months. The general market is around 4.00c, base. Those who must have shipments immediately might pay a little more but that price measures the maximum that most buyers will pay, and few companies are insisting upon more. Concrete reinforcing bars are in steady demand but bookings no longer are heavy, as both jobbers and contractors obtained their requirements early this month. Inquiry for iron bars is active and makers are turning down most of the new demand on the ground that they are committed heavily. The price of common iron bars holds at 4.50c, Pittsburgh.

Demand Still Exceeds Supply

Pittsburgh, March 23.—Demands upon the makers of cold-finished steel bars and shafting still are considerably ahead of production and so little headway has been made thus far in reducing old obligations that practically all of the larger manufacturers are out of the market at present. Those makers in a position to take on prompt tonnage are having practically no difficulty in securing 5.00c, base, while recently a sale of 1000 tons of small rounds for delivery over the next 30 to 45 days was made at 6.00c. Even more than the latter price has been obtained for bessemer screw stock. Shortage of cars is affecting practically all makers and one company in the Pittsburgh district recently has been using motor trucks to transport material to points from 2 to 17 miles to reach cars available for serving some of its customers at distant points. This company has been able to maintain 70 per cent plant operations as a result of this supplementary transportation service.

Refuse Most Bolt Inquiry

Chicago, March 23.—Makers of bolts and nuts are unable to act on more than a quarter of the inquiry now in the market, and in some instances turn down four requests from buyers for every one that is booked. Consumers are seeking immense quantities. A few contracts are being accepted from regular customers for second quarter specification, the material to be delivered during the third quarter.

Trying to Cut Obligations

Pittsburgh, March 23.—Makers of nuts, bolts and rivets are giving their attention to reducing old orders, and new demands largely are being turned down, as third quarter delivery is the best that can be promised. Books for the latter period have not been opened.

Demand Less Insistent

Pittsburgh, March 23.—Demand for hoops and bands for early delivery appears to be somewhat less urgent than it was recently, and while some business still is reported as high as 5.50c, base, the more general maximum of recent business has been 5.00c. It is believed that some tonnage for delivery over the latter part of the second quarter might be placed at 4.50c.

$240 Paid

For Carload of Ferromanganese at Pittsburgh—Early Supplies Scarce

Pittsburgh, March 23.—Users of ferromanganese who must have immediate supplies still find considerable difficulty in securing them except at extremely high prices. Sale of a carload of 76 to 80 per cent domestic material recently was made at $240, delivered in this district, and it is reported that less carload lots recently have sold as high as $275. Makers who have any prompt material generally are asking $250, while on last half shipments $180 is being asked, although not much business yet has been done here at this figure.

Ordinarily a scarcity of ferromanganese means a good demand for spiegeleisen but at present the latter is not eagerly sought. Most makers are pretty well completed on production over the present half year and offerings are scant. The general asking price of makers for 20 per cent average spiegeleisen is $60, furnace Pressure to sell is not heavy as producers believe that it must eventually bring more money unless there is a sharp decline in the prices of ferromanganese, as the premium on the latter material is much greater than usual.

The attempt to obtain more than $80, furnace, freight allowed, for 50 per cent ferrosilicon is having no success, and as far as sales here are concerned no basis exists for a higher price than $80. As a matter of fact not only the Canadian makers, but also some domestic producers, are offering this alloy at $80, delivered Pittsburgh. Sale is noted of some 12 per cent electrolytic ferrosilicon in pig form at $62, delivered Pittsburgh, which compares with the range of from $69.10 to $71.10, furnace, quoted by blast furnace interests making this material.

Demand Not Strong

New York, March 22.—Very little demand now features the ferromanganese market, so that the new domestic price of $180, delivered, for standard metal for second half has not yet been established on any con-

siderable volume of tonnage. The market is strong, however, and good-sized tonnages are expected to materialize at this figure. Most of the current inquiry involves ferromanganese for spot shipment and this totals several hundred tons, some of which is wanted for shipment to Canada. Spot metal, however, is very scarce and no new sales are reported. One importer now is asking $175, c.i.f. tidewater, on English ferromanganese for shipment from England, over the last half, commencing with August, but no sales yet have been made at this figure. Importers of English ferromanganese are manifesting some interest with respect to the citation which orders them to appear before the federal trade commission on May 3 in connection with allegations made by domestic producers last year that the former were selling to the United States in violation of the antidumping law.

Some spiegeleisen has been sold during the past week for spot shipment in carloads at $60, furnace, for 20 per cent metal.

Although some leading makers of 50 per cent ferrosilicon are quoting $85, delivered, quotations still are being made of $82, delivered in the Pittsburgh district and some prices even lower are heard. It is understood some alloy, usually spoken of as "resale" but really originating in Canada, is being sold at concessions, the Canadian makers having an advantage by reason of the exchange situation.

The markets for special ferroalloys are dull, with prices unchanged. English makers are asking a little more money for ferrotungsten, having refused certain bids of less than 75 cents a pound contained. American makers continue to quote around $1 a pound contained. The tungsten tariff bill continues to attract leading interest.

Not Selling Western Ferro

Chicago, March 23.—Inquiry for ferromanganese is active with the local stack not now taking further business, having sold for as long a period as seems advisable at present. This interest has not sold anything for remote delivery, contenting itself with prompt tonnages. Its former price was $200 for 70 per cent, and $235 for 80 per cent. It is understood some resale material has been moved recently at $250. Quotations at $180 for last half ferromanganese has been heard, but no sales are known. Spiegeleisen is inactive at $60, eastern furnace. Ferrosilicon is being quoted at $80 to $85, eastern furnace, and in small lots at $90, with some contracts for remote delivery at $62.50. Producers of this material appear to be fairly well sold up.

Last Half Ferro Sold at $180

Philadelphia, March 23.—Several hundred tons of domestic ferromanganese for the last half have been sold at $180, delivered but inquiry for the last half is slow. Considerable inquiry is noted for prompt shipment, and sales of 72 to 76 per cent at $230, delivered, for prompt shipment are noted. Spiegeleisen production will be less, as one interest making this metal will omit it for an indefinite period.

Plate Market Is Easier

Maximum at Pittsburgh and Philadelphia Now Appears to Be 4.00c, with Inquiry Falling Off—Car Builders Take 11,000 Tons at Chicago

Philadelphia, March 23.—Plate inquiry is falling off in volume so that in some directions the market is easier. While plates recently were turned away at 4.00c, Pittsburgh, they now are being accepted, and it is reported that some mills previously doing 4.00c might sell at less if urged. However, the market is strong statistically, as all makers have big order books. While universals can be had in four to six weeks, it is difficult to get sheared plates before July. It is pointed out that while inquiries are less numerous most of them are for definite and specific jobs, which when closed mean bona fide orders and not estimated requirements. Railroad buying continues in the lead. Two makers that took second quarter contracts are now out of the market on sheared plates, and one is practically out on universals. Considerable plate tonnage has been sold by one mill for prompt shipment by reason of increased production. On the other hand, the coal shortage continues to embarrass some makers. One mill which says that it is getting orders that exceed its present reduced output, and even exceed the full output that would materialize if sufficient coal were obtainable, states that if the present condition continues it will have to increase prices.

Maximum About 4.00c

Pittsburgh, March 23.—While some plate makers still are seeking more, the market does not appear to be quotable at above 4.00c, Pittsburgh, on any recent business. The reaction from the extreme prices recently reached may be ascribed to the fact that some export tonnage, which is not being ordered out on account of the exchange situation, is filtering back into domestic channels, giving buyers an advantage they did not have a short time ago. Not much actual railroad business yet has come to the equipment companies in this district and they are not yet particularly heavy buyers of plates. Indeed, with only partly filled order books and railroad demands chiefly for repair parts, they are in the market only for moderate tonnages. Fabricating interests still complain of slow deliveries of plates against contracts. Car shortages are interfering with deliveries, but not with the production of plates.

Carbuilders Get Plates

Chicago, March 23.—While the leading interest has been disposing of its apportioned last half tonnage the allotments usually are less than customers would like, and the supply of plates now is practically exhausted for 1920 delivery. This leaves the forthcoming distribution by the leading independent the sole remaining source of steel plates. The quotation of the former remains at 2.92c, Chicago, mill, and it is believed sales by the latter will be at nothing less than 4.00c, Chicago mill, although nothing official relative to this price can be obtained. Recent orders for freight equipment and repairs involve about 11,000 tons of steel, an unusually large proportion of which is plates.

Leading Interest

Discontinues Selling Wire at Prices Prevailing at Delivery Time

Chicago, March 23.—Although shortage of railroad equipment in which to ship wire and nails has been interfering considerably with shipment of this material for some time, the past few days have shown a worse condition than had prevailed before. The mills again are piling their product as shipments are much less than production. Some selling is being done to regular customers not protected on present contracts, the price being the March 21, 1919, schedule. The plan followed for a short time of selling at the price prevailing at the time of delivery has been discontinued by the western wire producer.

Car Shortage Still Effective

Pittsburgh, March 23.—Makers of wire and wire products continue to pile up considerable tonnages as there has been no improvement in the car supply situation and shipments are falling considerably short of balancing production. Some improvement is expected this week in the shipping situation due to the warmer weather, but it is probable that several weeks will have to elapse before manufacturers will have reduced their old orders sufficiently to be interested in much new business. Current demands for both nails and wire are heavy, although some of the independent companies claim that jobbers are reporting that they are getting larger shipments of nails from the American Steel & Wire Co., carrying the old price of $3.25 per keg, base Pittsburgh. One large independent company is quoting nails at from $4.25 to $4.50, base, but the more general price of the independent companies is $4, base.

Second Quarter Nails Sold at 4.50c

Philadelphia, March 23.—Several hundred tons of nails have been sold at 4.50c, base Pittsburgh, for the second quarter. This now is the minimum price for one independent which previously had booked considerable business at 4.25c. Considerable plain, bright wire has been sold for the second quarter by independents in the past week at 3.70c and 4.00c, Pittsburgh. Fair quantities of barbed wire sold for the second quarter at 4.60c and 4.85c. Orders for bessemer wire rods at $75 and $80, Pittsburgh, are being turned away.

Scrap Market Is Slow

Little Tonnage Generally Changing Hands Though Chicago Situation Seems at Bottom — Prices Are Soft

FOR COMPLETE SCRAP PRICES SEE PAGE 958

Chicago, March 23.—Scrap iron and steel in the Chicago market apparently has reached bottom and the turn made a week or more ago continues to carry prices slowly upward. Labor constitutes one of the strongest factors, and its influence is being felt throughout the market. One effect is to bring out more mixed scrap than usual because railroads and other producers cannot find labor to sort and prepare it. The looked-for outpouring of scrap by railroads is expected to be followed by difficulty in making deliveries on account of the car and labor shortage and if this follows undoubtedly it will have the effect of delaying shipments and it is believed would help to support prices. Contraction of bank credits, a part of the general program to reduce inflation, is having some effect in causing dealers in less secure position to part with their material, and this is believed to have been responsible for much of the decline during the past month. Railroad offerings are not liberal and have not been up to expectations. The Burlington offers 3750 tons, in which is included 475 tons of 52-pound iron rails. The Chicago Great Western offers 1000 tons.

Boston Prices Soften

Boston, March 22.—Scrap iron and steel dealers, anticipating further softening in prices, are more anxious at present to complete old contracts than to enter into new ones. Cars have been scarce, and shipments delayed on business placed several weeks ago. During the past week a large tonnage of heavy melting steel moved to Pennsylvania points from New England, but this was almost entirely on old orders, and little new business was placed. The market in most steel mill grades has further softened, though a strong demand still continues for cast iron. Approximately 2000 tons of No. 1 and No. 2 machinery scrap was sold to consumers through Boston dealers during the past week and the spread from $44 to $46, delivered, probably would cover all of the sales. Current demand for wrought iron is light.

Big Tonnages Moving

New York, March 22.—Because of the improved weather conditions and the recent withdrawal of railroad embargoes and the somewhat lessened car shortage, a huge amount of iron and steel scrap now is being moved to consuming plants and dealers' yards. This big movement is the chief feature of the market at present. While there is a considerable amount of buying, it consists mostly of small tonnages. Lists issued by the railroads in this district at the beginning of March were much smaller than usual by reason of the snow and the storms which prevented the scrap from being brought to the points of accumulation. It is expected that the present open weather will result in increasing the April lists, but it is believed that the great bulk of the scrap on eastern railroads will not be offered until the May lists come out.

Big Shipments Aid Situation

Philadelphia, March 23.—The scrap situation generally is easier here by reason of the big shipments of the past week or two. Few grades are in demand and the mills have reduced prices on heavy melting steel. While they do not want any tonnage they might buy perhaps if they could get it around $25. Railroad wrought is easier by reason of the improved shipments of this and equivalent grades. The Bethlehem Steel Co. reduced prices on blast furnace turnings and now is offering to pay $18.50, delivered South Bethlehem and $1 higher for Steelton, Pa., and Sparrows Point, Md. Machine shop turnings and cast borings are easier. That company's Lebanon and Harrisburgh, Pa., mills bought the latter part of the week but now are out of market.

Conditions Little Changed

Pittsburgh, March 23.—No improvement can be reported in the scrap iron and steel market here as regards open-hearth grades of material. Most of the steel manufacturers are asking that contract shipments be postponed. While only moderate tonnages of the steelworks grades are coming upon the market, they are considerably in excess of current demands and sales are possible only at low prices. Dealers who have no yards on which to throw down tonnages are hard hit by present conditions, while dealers with yards are buying the "distress" tonnages as a means of supporting the market and protecting themselves against some of their high priced sales. About the only business of importance recently done with any of the steel companies was a sale of some round lots of turnings to a company with a plant in Pittsburgh and another about 18 miles outside the city. It is understood these purchases were made at around $18.50, delivered.

Low Phosphorus in Demand

Buffalo, March 23.—There has been considerable inquiry by makers of railroad equipment for tonnages of low phosphorus. Some sales of this material have been made probably at $32.50 for strictly low phosphorus, as that is the price at which this grade now is being held. Heavy melting steel shows an enlivened interest with one large consumer near Buffalo having just come into the market for 5000 tons. This consumer is ready to pay $26 for steel if it is of a strictly No. 1 grade. Rejections of scrap tonnages during the past week have been numerous due to the fact that consumers find they have not been getting exactly what they paid for. Consumers and purchasers of heavy melting steel find that in recent tonnages sent to their yards there is a good deal of lighter grades which are unsuitable for their needs.

Some Grades Are Down

Cleveland, March 23.—Why scrap iron and steel continues weak while almost everything else in the iron and steel industry is strong has so baffled dealers here they have ceased trying to chart the future and are working on a day-to-day basis. A few grades have been marked down, none has been marked up, melters continue refusing to buy except at several dollars under the market—this sums up the local market for the past week. Fewer forced sales have been made in the past week, but only because dealers have been holding up scrap at the producing end. To get steel into the McKinney Steel Co. yard again is difficult. Labor costs are advancing, dealers complain, and one Cleveland yard was compelled to advance its common labor twice within 48 hours. Quotations on steel car axles, small drop forge flashings, pipes and flues, cast iron borings, and bundled sheets have been marked down. On heavy melting steel and machine shop turnings the bottom of the spread has been dropped 50 cents, making the former $25 to $26.

Steel Tonnage Placed

Cincinnati, March 22.—The scrap market has resolved itself into a decidedly inactive one, the interest of dealers being confined largely to replenishing stocks. There was a considerable drain on the market last week, good buying developing in all grades, and stocks are found to be rather low. The buying demand has not ceased entirely but few shipments are being made and prices hold firm. The recent advance in heavy melting steel has been maintained and a considerable tonnage has been booked at $25 for early delivery to a northern Ohio melter.

Market Quiet, Prices Firm

Birmingham, Ala., March 23.—The scrap market in the Birmingham district is quiet, but prices are firm. Consumers of heavy melting steel are showing a willingness to buy but the prices they are offering are $5 less than those wanted by the dealers. Good deliveries are being made on old contracts. Not much scrap is being bought by dealers in this section. A general scarcity of material is reported.

Tin Plate Orders

For Balance of First Half Refused —Shipments Still Limited

Pittsburgh, March 23.—No material improvement has been made in the movement of tin plate, for only in a few instances have manufacturers been able to secure any more cars than recently. With production on a comparatively full scale further piling of finished material has been necessary.

Independent manufacturers still are booking contracts for last half tonnages from their regular customers, in most cases at prices in effect at time of delivery. No business in standard tin plate is being accepted for delivery over the remainder of the first half, as all makers are so heavily committed that entering of new orders would involve sacrificing old business to fill them. Good demand is noted for stock items and sales are reported to be made readily at from $8 to $8.50 per base box, Pittsburgh. On export inquiries $10 per base box, Pittsburgh, appears to be minimum on standard tin plate and some makers recently have quoted as high as $11.

Selling for Third Quarter

Philadelphia, March 23.—One eastern maker is selling considerable tin plate for second and third quarters at $8.50, Pittsburgh, base box. Some tin plate is being sold off stock list, by Pittsburgh makers at $8.

Upward Trend

Still Shown By Warehouse Prices—Chicago and East Again Advance

New York, March 23.—The scarcity of light round cold-rolled bars, small diameter hot-rolled bars and sheets is reflected in the inquiries which are coming to warehouses in this district from consumers all over the country who are desirous of good sized tonnages for immediate shipment. So scarce are these materials that the warehouses are apportioning such stocks as they have. Other materials also are hard to obtain. The minimum price on blue annealed sheets for shipment out of stock in this district now is 6.12c, for No. 10. Galvanized sheets are held at 8.75 to 10.00c for No. 28. On cold rolled shafting out of stock, the market has gone up around 1.00c per pound. Cold rolled shafting is quoted at 6.00 to 7.50c, and cold rolled flats, squares and hexagons at 6.50c to 7.50c.

Bars Are Advanced

Philadelphia, March 23—Jobbers of iron and steel in this district report the market for their class of material still is unsettled with the tendency of prices still on the upward grade. Steel and iron bars now are quoted at 4.75c, an advance of 25 cents per 100 pounds. Shapes, which were being quoted at 4.25c to 4.50c, and are now quoted at the flat price of 4.50c. Other material remains unchanged.

Prices Tend Upward

Cleveland, March 23.—Active demand has caused a further increase on some lines of warehouse iron and steel material in this district. One jobber reports he no longer is quoting steel bars in accordance with the base rate, making all prices and sales of this material according to sizes on hand. This, it is stated, is because of the high prices that must be paid for the material by the jobber himself. The maximum price on steel bars is 6.00c; blue annealed sheets are being quoted at from 6.75c to 7.35c; black sheets, 6.75c to 8.15c and galvanized sheets, 9.00c to 9.50c.

Refuse Big Sheet Orders

Present Bookings so Heavy Valley Mills Are Unable to Quote for Delivery in Second Quarter—Blue Annealed Sells at 5.00c in East

Youngstown, O., March 24.—Large tonnage orders are being refused right along by makers in this district. This month usually finds makers about ready to take on second quarter business. Doubt is expressed whether present booking will permit producers to commit themselves any further ahead. A few makers have checked up their unfinished business for this quarter's delivery and find that a considerable tonnage will have to be carried forward into second quarter. Until this runover tonnage is determined definitely, practically all makers refuse to state whether they will or will not have any sheets to offer for second quarter shipment.

As a matter of opinion, however, it is thought the present shortage of all grades of sheets, particularly black and galvanized, will continue for some time to come. The present scarcity is not due solely to the demand but to the shortage of semifinished material. Steel production in this district has been at a low point off and on for the past seven months due to the shortage of fuel. The shortage of steel, therefore, has been felt by all sheet bar manufacturers who have not been able to turn out their product as fast and in such proportions as the trade demanded. Makers having their own sheet bar mills were compelled in two instances to curtail operations in their sheet mill departments either because of a sheet bar shortage or of a lack of carriers.

A large per cent of the sheet tonnage rolled recently or due to go on schedule soon was booked at or near 5.00c for black. Mills then were in a position to buy their sheet bars around $51. Few makers here have been fortunate recently in buying sheet bars under $75 and in some cases sales have been made as high as $80 for bessemer and $90 for open-hearth sheet bars. If a real market existed here today quotations for one-pass black would be around 7.00c, base. It would not be surprising if considerable second quarter business would be closed at or higher than this figure. Considerable business was closed with the understanding that prices would be determined at the time of shipment.

Sales of one-pass black for prompt shipment were made recently at 9.50c and 11.00c, mill. The market for resale black and galvanized is stronger this week than last. A sale of 200 tons of 14-gage black for prompt shipment was made to a Cleveland consumer at 10.00c, base Pittsburgh. Little galvanized is available right now. Tonnages of this grade that are to be had, are quoted between 10.50c and 11.00c, Pittsburgh. Spot automobile sheets both of fine finish and deep drawing quality for prompt delivery practically are off the market. The box car supply remains scant, some mills receiving only three or four daily. Considerable complaint from the trade on account of sheet shipments going forward in open cars are being received by makers but unless this type of carrier is resorted to, consumers stand little chance of getting their material reasonably soon.

Blue Annealed Now 5.00c

Philadelphia, March 23.—The minimum price of blue annealed sheets in the East now is 5.00c, Pittsburgh, for No. 10. Several thousand tons for third quarter delivery have been sold at this price and 5.25c. An eastern steel interest which hitherto has not been a seller of sheets, but which will produce them, expects to come into market later than previously expected. It has quoted around 7.00c, Pittsburgh, for No. 10 blue annealed for the last quarter. Western sheetmakers are selling very little tonnage in this district.

Still Piling Much Tonnage

Pittsburgh, March 23.—Lack of adequate transportation facilities still is keeping down the movement of sheets, and all manufacturers are piling a good deal of their current production. While the car supply for a number of manufacturers has improved slightly as a result of the warmer weather, only in a few instances has the improvement enabled sheet makers to bring shipments abreast of production. Shortage of steel still is preventing full mill operations although it is not quite as potent a factor in this direction as it was a short time ago. The American Sheet & Tin Plate Co. has about 90 per cent of its sheet mills in operation while independent mill operations are in the neighborhood of 80 per cent of capacity. This would mean that the industry as a whole is operating today at around 84 per cent. No lessening in the demand is noted, and while the most insistent inquiries still are coming from the automobile manufacturers, makers of stoves and electrical equipment are pressing hard for deliveries against their contracts.

No Sheets Available

Chicago, March 23.—Apportionment of its remaining sheet tonnage for last half probably will be taken up by the leading independent producer in the Chicago district within a fortnight. No schedule of sizes or prices has been determined and its books probably will not be opened, in the usual sense of the term. Demand continues strong with inability of buyers to place their business. Prices are a matter entirely of individual cases, with the limit practically what any consumer is willing to bid, based on his necessity.

Italy is reported turning to the Orient for new fields of trade. Increasing commercial friendship with Japan is evident.

Awards of Week Lively

Aggregate Structural Tonnage Placed Around 25,000—Ford Places 6000 Tons—Big Chicago Hotel to Proceed—Shape Prices Stiffer

Chicago, March 23.—Offerings of structural material by the leading interest covering its last half production have been taken in full by all its regular customers, and almost all have asked for more than the proportion allotted. The result is that practically no more structural tonnage can be expected from this source for 1920 delivery. The leading independent will have some tonnage to apportion during next month for last half delivery, but has not yet come to the point of dividing it. In the case of the former seller, the March 21, 1919, schedule has applied, but something higher than this figure will be asked by the latter, to cover the change in conditions. The leading interest continues to quote 2.72c, Chicago mill, on plain material, while other figures as high as 3.72c, Chicago mill, are being done.

Contracts for structural steel during the past week cover a number of projects, the largest of which is 1800 tons for the Pacific Mutual Life Insurance Co., at Los Angeles. Other tonnages are small. The proposed Pershing Memorial hospital at Cheyenne, requiring 400 tons of steel has been dropped on account of high costs. The warehouse for the Steel Sales Corp. at Chicago, first figured at 1000 tons has been revised and now will require 270 tons. The tonnage for the Federal Reserve bank building at Kansas City has been definitely decided at 4112 tons. Increase in the limit of building height in Chicago from 200 to 260 feet has been voted by the city council and awaits the signature of the mayor. Immediately announcement is made that owners of the proposed Ritz-Carlton hotel, which has been held up several years because of height restriction, will proceed with this building, which will involve between 10,000 and 15,000 tons of steel.

Fabricators Are Busy

Boston, March 22.—Fabricators are as busy as deliveries of steel will permit. A falling off in the awarding of small jobs has been more than made up by larger contracts. Much work is planned for early construction. The week's awards include a high school for Lowell, Mass., requiring 200 tons and a manufacturing building for the Lorraine Mfg. Co., Westerly, R. I., requiring 250 tons.

Eastern Demand Is Light

Philadelphia, March 23.—Demand for shapes is slow, and new orders in the past week were light. It is reported that they included one lot of 1000 tons for India. Mills have big orders on their books, and while in some cases they can taken on certain sections, buyers have to shop around for other sections. It is said that inability to secure all the desired sections prevents buyers in many cases from placing orders which otherwise would materialize. Second quarter contracts, which one maker is taking at 4.00c, Pittsburgh, are coming in slowly. Current quotations by the independents range from 3.75c to 4.00c, while for some material out of stock as high as 4.50c is being obtained.

Expect More Awards Soon

New York, March 23.—While the structural market is dull, substantial buying is likely to set in before the end of the week. Orders expected to be placed immediately include 5500 tons for an office building here for the Fisk Rubber Co., 6000 for the Western Union Telegraph Co.'s addition, 3500 tons for the Borden Condensed Milk Co., two lots of about 1500 tons each for buildings on Nashua street and Maiden Lane, respectively, and 600 for the Columbia Trust Co.'s addition on Fifth avenue and Thirty-fourth street. Recent contracts include 1200 tons for plant additions for Gilbert & Barker, Springfield, Mass., and 1000 tons for the Boston & Maine railroad bridges. The latter is asking for 300 tons additional. The minimum quoted by independent mills appears to be 3.50c, Pittsburgh. As high as 4.25c and 4.50c has been done on plain material for early shipment.

Structural Inquiries Still Heavy

Pittsburgh, March 23.—The amount of structural steel business in sight still is reported to be large and considerable optimism still exists among fabricating interests with regard to the immediate future of the situation. While considerable talk is heard in various sections of the country as to the effect which the high cost of building materials is having upon new construction, the trade here is cheerful because of the existence of so much prospective business which it is believed must go through regardless of the cost. Fabricating interests still are naming comparatively high prices against new projects chiefly because mill deliveries of plain material are still slow and there is always danger that structural interests may be obliged to seek supplies at warehouses. Prices of shapes remain firm on tonnages for shipment over the next 60 or 90 days, and one company which recently booked business at 3.10c, base, for beams, has announced that its minimum price now is 3.35c. Another independent still is adhering to a base of 4.00c for shapes, plates and bars for structural purposes.

General Prices Block Awards

Cleveland, March 23.—Inquiry for structural shapes continues on a fairly large scale, but actual awards are few and far between. It is currently reported that the building planned by the Citizens Savings & Trust Co., requiring 15,000 tons of steel, contract for which was awarded last fall has been held up, but this proves unfounded, except that some delay is understood to have been caused by the high prices quoted on marble and other material entering into the construction. Prospective builders are finding more fault with prices of other material than they are with prices of steel, and this is tending to keep down activity in the structural steel market. Coupled with this is the fact that the fabricating shops have several months' work ahead, and the leading independent manufacturer of shapes is still out of the market. The *Cleveland Plain Dealer* is again taking bids on 1000 tons, the first bids received some months ago having proved unsatisfactory.

CONTRACTS AWARDED

Mill buildings for the United Alloy Steel Corp., Canton, O., 1200 tons to the American Bridge Co.

Foundry buildings for the River Rouge plant of the Ford Motor Co., Detroit, 6000 tons to the American Bridge Co.

Fertilizer building for Swift & Co., Norfolk, Va., 1000 tons to the McClintic-Marshall Co.

West Springfield bridge, Springfield, Mass., 2500 tons to the McClintic-Marshall Co.

Car shops for Gilbert & Barker Mfg. Co., Worcester, Mass., 2000 tons to the McClintic-Marshall Co.

Apartment house for Ninety-Eighth and Broadway Realty Co., New York, 2600 tons to the McClintic-Marshall Co.

Office building for Pacific Mutual Life Insurance Co., Los Angeles, 1800 tons, to Llewellyn Iron Works.

Silverwood building, Los Angeles, 800 tons, to to Llewellyn Iron Works.

Addition to building for American Medical association, Chicago, 399 tons, to reinforced concrete.

Sugar factory buildings for Holly Sugar Corp., Delta, Colo., 300 tons, to Midwest Steel & Iron Works, Denver.

Buildings for American Brake Shoe & Foundry Co., Chicago, 239 tons, to Morava Construction Co.

Bank and office buildings at Madison street and Kedzie avenue, Chicago, 113 tons, to Federal Bridge Co.

Enameling building for Coonley Mfg. Co., Cicero, Ill., 105 tons, to Federal Bridge Co.

New calendering mill for Neenah Paper Co., Neenah, Wis., 125 tons to Northwestern Bridge & Iron Co.

High school, Lowell, Mass., 200 tons to Boston Structural Steel Co.

Building for Lorraine Mfg. Co., Westerly R. I., 250 tons, general contract to J. H. Tower Construction Co.

Building for Pierre Dupont, Wilmington, Del., 400 tons; awarded to Belmont Iron Works.

Plant additions for Gilbert & Barker, Springfield, Mass.; 1200 tons, to American Bridge Co.

Bridges for Boston & Maine railroad, 100 tons, to American Bridge Co.

Boston & Albany, 230 tons, to Bethlehem Steel Bridge Co.

CONTRACTS PENDING

Peoples bank, Marietta, O., 350 tons, bids asked.

Federal Reserve bank, San Francisco, 1000 tons, bids asked.

Bamberger Department store, Newark, N. J., 1600 tons, bids asked.

Units 14-A and 15-A for Western Electric Co., Chicago, 1800 tons, bids asked.

Ore bridge for Carnegie Steel Co., at Mingo Junction, O., 450 tons, bids asked.

Raughn building, Akron, O., 700 tons; bids being taken.

Building for General Fire Extinguisher Co., Warren, O., 450 tons; bids being taken.

Alterations to National City bank building, Cleveland, 150 tons; bids being taken.

Building for Cleveland Plain Dealer, 1000 tons; bids being taken.

Building for Houghton Malleable Castings Co., Toledo, O., 1000 tons; bids being taken.

Heavy Backlog

Continues in Mill Pipe and Demand Continues in Large Volume

Pittsburgh, March 23.—Because of fuel and car shortages, makers of pipe, both wrought iron and steel, have not been making any particular headway in reducing accumulated orders. While the National Tube Co., has succeeded in making a fairly satisfactory showing in shipments, conditions have been unsatisfactory at its Lorain, O., works, and the flooded condition of the Ohio river caused a three-day suspension last week at the Riverside works of this company at Benwood, W. Va. Not much improvement is noted in the fuel or car situ-

ation, and the Youngstown, O. manufacturers have not been able to maintain anything like constant plant operation, so the output of pipe has suffered along with all other steel products. Demand for pipe, both merchant and oil well, still is on a heavy scale but the manufacturers are giving no attention to new business until they have made some progress in the matter of cutting down old obligations. Newspaper dispatches to the effect that 200 or 300 miles of line pipe recently placed in the Pittsburgh market are not verified.

Prices Tending Upward

New York, March 23.—That prices of cast iron pipe are tending upward in the east is reflected by sales of 200 tons of 6-inch and over to Fall River, Mass., at $26.22 f.o.b. maker's plant. This business went to the Warren Foundry & Machine Co. New York City closes today on 1800 tons. Private demand is good.

Pipe Inactive at Chicago

Chicago, March 23.—Iron pipe in the Chicago market is not active, and such tonnages as are pending are small. Bids will be opened March 25 at Milwaukee, Wis., on 141 tons and April 1 at Elsie, Nebr., on 55 tons. The United States Cast Iron Pipe & Foundry Co. has been awarded 2900 tons by the city of Detroit. Most makers continue to quote a premium over prevailing quotations on smaller sizes.

Car Orders Held Back

Difficulties of Financing and of Obtaining Early Steel Supplies Are Obstructive Factors—1500 Lot Placed—Inquiry Is Heavy

Chicago, March 23.—Buying of railway equipment is proceeding slowly and of the total of about 30,000 cars on inquiry early in March, only a small portion has been placed with builders. This delay is due in part to difficulty of financing purchases and also to the inability of carbuilders to obtain protection on steel tonnages required for the equipment. Railroads which have not put out inquiries for cars are deterred in some instances by the increase from a former cost of about $800 for a box car to present figures ranging as high as $3600 each. In the case of some roads the present figure is fully prohibitive. Contracts have been placed with the American Car & Foundry Co. for 1000 refrigerator cars, and 500 box cars, the name of the purchaser being held confidential. This lot will require 9000 tons of plates, shapes and bars and 700 tons of axles. The same builder has contracted for the repair of 500 box cars for the Baltimore & Ohio railroad, which will require 1000 tons of plates and shapes from a local mill, the necessary bars being bought elsewhere. The Union Pacific railroad has bought from the Pullman Co. 65 passenger cars requiring 950 tons of plates and shapes and 150 tons of axles.

Some inquiry for standard steel rails is coming in, mostly in small lots and is not being covered. Present plans do not promise much for later delivery, even if the steel production of mills is increased as it is unlikely further ingot tonnage will be apportioned rail mills while other finishing mills are in need of this material. Inquiry for track fastenings is large but contracts are being made only to round out the programs of roads which have rails on order. An inquiry for standard steel rails for 1921 delivery has been put out, involving 25,000 to 30,000 tons but no definite consideration has been given it. Light rails are being booked at a rate about equal to production, but inquiry runs to several times the tonnage taken.

Makers Largely Out of Market

Pittsburgh, March 23.—So heavily committed are the makers of spikes that their tendency is to decline new business. One large company has at least four months' production booked and is refusing to sell further ahead, although not declining to enter orders from what are classed as regular customers. Prices merely are nominal for both standard and small spikes, and represent only approximate price ideas of makers. Track bolts are firmly priced, with makers well sold ahead. Light rails are in active demand and not quotable from independent mills at less than 3.50c, base, while on a recent export inquiry for 12-pound sections 4.50c was named by one maker.

More Rails Are Placed

Cleveland, March 23.—The Nickel Plate railroad has placed 3000 tons of rails additional for May-June delivery with the Lackawanna Steel Co., and are closing up for 2500 tons with the Carnegie Steel Co. A heavy demand for steel wheels is reported by makers and deliveries are falling behind. The 150 locomotives under negotiation for the New York Central railroad still are pending.

Order 100 Locomotives

Philadelphia, March 23.—The Baldwin Locomotive Works has received an order for 100 locomotives from the Chicago, Milwaukee & St. Paul railroad.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
March 17	18.25	62.25	9.25	8.375	33.00	11.00	43.00
March 18	18.25	61.25	9.25	8.70	33.00	11.00	43.00
March 19	18.12½	63.50	9.25	8.625	33.00	11.00	43.00
March 22	18.25	62.00	9.25	8.625	33.00	11.00	43.00
March 23	18.62½	61.25	9.25	8.60	33.00	11.00	43.00

*Future shipment from Singapore or London.
†American Smelting & Refining Co.'s price.
‡Producers.

NEW YORK, March 23.—Following a period of wide swings in prices with considerable speculative activity, the nonferrous metal markets have assumed a somewhat more stable position and consuming interest has reappeared. Copper sold down last week to the lowest price since early in December, sales being made at 18.12½c, delivered, for April and May deliveries. Operators in lead one day the past week dropped the price of that metal ⅛ cent a pound in the outside market, since which time there has been a recovery of ¼ cent. The tin market has fluctuated wildly, price changes of more than 1 cent a pound taking place in the course of a day, and of from 2 to 4 cents in the course of two days. This erratic movement has resulted from the speculative trading in London and also from the fact that New York has been the cheapest market in the world in which to buy tin. London houses did a big arbitrage business, buying tin here and selling it in London to apply on American contracts. In one case it was rumored some tin had actually been shiped from New York to London, but this probably was untrue. With market conditions so unstable, consumers have been loath to buy except for urgent and immediate requirements.

Following the decline in the price of electrolytic copper to below 18.25c, reports appeared in the daily press of a corporation being planned to finance export business of copper, so that Europe could buy copper on a credit basis, from the United States, by means of a revolving fund. While some copper sellers were inclined to regard the report as a peg on which to hang a recovery in copper prices, it is true that domestic consumers came into the market, including both some copper wire and brass mills and placed fair tonnages for second quarter delivery. Some producers on March 22 raised their asking price to 18.50c, delivered, and a general advance to 18.62c was made today for prompt and April. In the outside market scattered sales were made at 18.50c, f.o.b. refinery. Casting copper was quoted 18.25c to 18.37½c, New York, but was scarce.

After its sensational drop on Wednesday from 9.50c, New York, to 9.00c, due to manipulative measures, lead recovered by Saturday to 9.25c. Sales were made at this price for April shipment by independent producers March 20 and 22. In the meantime resale lead had been forced on the market and the way cleared for expected renewed advances.

The zinc market sold down to 8.25c, East St. Louis, for prime western for April shipment, early last week, but quickly recovered. The recent decline was due largely to resale offerings by exporters who had metal bought and who were instructed by their English correspondents to resell, owing to market decline abroad. The market jumped from 8.25c to 8.62½c and since has held at about this figure. Some galvanizing business has been done, mostly April shipment.

Consumers have held aloof from the tin market, excepting on the sharp breaks, when they were attracted by the low prices and closed for some tin. The stocks of tin in New York, which for a time were so unwieldly, have been pretty well depleted and whereas futures had been commanding a premium of 1 cent or more it now is believed spot soon will command a premium over futures. On March 22 sales of Straits tin for April-May shipments were made publicly at 62.00c.

Antimony has been somewhat weaker, wholesale lots having sold at 11.00c to 11.25c, duty paid.

Financing Is Arranged

Incorporated recently with a capital of $1,500,000, the Ashtabula Steel Co., Ashtabula, O., now is being financed to build a sheet mill in that city. About $800,000 is being furnished in Ashtabula, while Hunter Glover & Co., Cleveland, will complete the arrangements. Seven of the nine directors are Robert Lock, Pittsburgh; Hunter Glover, Cleveland; L. T. Carlisle, T. J. Rennick, P. C. Remick, H. H. Kunkle and T. P. Fitzgerald of Ashtabula.

Semifinished Goes Higher

Open-hearth Sheet Bars for April Delivery Fixed at $80 Youngstown—$95 Is Offered—Small Billets Up—Material Scarce

Cleveland, March 23.—Consumers of sheet bars in valley, northern Ohio and surrounding territory will be invoiced for April delivery on the basis of $80, Youngstown,, for open-hearth steel. This is the price which has been settled upon by makers of sheet bars in this district to apply to running, term contracts for the month in question. Contracts totaling thousands of tons are involved. The settlement price for March for open-hearth sheet bars fixed several weeks ago, was on the basis of $65, Youngstown. April deliveries on small open-hearth billets also have been fixed at $80, Youngstown, and on open-hearth slabs at $70, Youngstown. Very little semifinished material now is being offered on the market. Those interests which recently had surplus tonnage to dispose of because of the tie-up of finishing mill operations are out of the market at present. There is a considerable unsatisfied demand for sheet bars and makers in this district report they could have obtained $95, Youngstown, on one lot this week had the material been available. Regulations of the coal administration that coal cars received by steel companies may not be loaded with outgoing material but must be returned directly to the mines are making it more difficult for local steelmakers to move semifinished shipments and some of the local finishing plants are suffering for want of supplies.

A mill which usually does not figure in the market in this territory sold 500 tons of small open-hearth billets to a Cleveland consumer during the week at $65, Pittsburgh. The conditions are somewhat special.

Seeks Ingots in East

Philadelphia, March 23.—An inquiry is current her for a large tonnage of ingots for a western consumer. This indicates the scarcity of steel in the West. It is doubtful whether eastern mills will quote on this business as indications do not point to any surplus of ingots here. More than 1000 tons of rerolling billets sold at $60, Pittsburgh, and several small lots of forging billets were sold at $75, Pittsburgh, all for second quarter.

Steel Shortage Pronounced

Youngstown, O., March 24.—Unless consumers of semifinished material already are on the books of makers in this territory, they have small chance of obtaining any further tonnages. The scarcity of semifinished steel is due directly to the fuel situation. For the past seven months steel mills here have felt the pinch of the coal shortage. At times makers were finding it difficult to produce enough steel to supply their own mills let alone their regular customers. Sheet bars are in strong demand. Makers are not taking on any additional tonnages except from their regular customers and even then bookings are limited. Most sheetmakers now are converting $51 sheet bars which were contracted for weeks ago. Recent sales of this material average around $75, Youngstown, with the majority of sales now running at $80 for bessemer and $90 for open-hearth quality. Not knowing what future conditions hold in the way of production, makers have little encouragement to offer those looking for sheet bar tonnages. Orders now on schedule have been delayed so long that the coming out of any promise of delivery is beyond the power of the maker.

Rods Are in Good Demand

Pittsburgh, March 23.—Active demand is noted in this market for wire rods, and although finishing departments of manufacturers making their own steel are far from fully engaged, none too many rods appear available and little trouble has been experienced in selling the base size at $70, mill. Some business even has been taken as high as $75. Not only are the nonintegrated wire interests taking hold quite freely, but fair sized tonnages are going for concrete reinforcing purposes, due to the fact that even at $75 rods are much cheaper than bars for this purpose.

Demands for billets and sheet bars appear to be a little less urgent than recently, but in the lack of any material increase in the offerings, recent prices are well maintained. As recently noted bessemer sheet bars have been sold for early shipment at $80, Youngstown, and some makers of open-hearth bars have settled on $70, Youngstown, as the figure to apply to April shipments. These arrangements involve large tonnages. Prices of these latter forms of steel are following closely the prices at which finished material can be moved against prompt shipment orders.

Strip Bookings Heavy

Pittsburgh, March 23.—Demands upon the makers of strip steel in this district are still on a large scale and as little progress is being made in the matter of reducing old obligations, on account of the scarcity of cars, prices remain extremely strong. Hot-rolled strip steel now is not obtainable at less than 5.50c, base, this price being a minimum both on tonnages wanted for early delivery and also on shipments made against orders placed some time ago calling for a price at time of delivery. Present bookings of manufactures are sufficient to keep them fully engaged at least for the next three months and even longer in some instances. Cold-rolled strip steel takes a range of from 8.50c to 9.50c, base, but few makers would today consider the lower price for even small lots, except from their regular customers.

Unloading Rates

On Iron Ore May be Raised—New Vessel Rates Protested

Pittsburgh, March 22.—The coal, iron ore and coke committee of the Central Freight association has postponed until April 1 the hearing in regard to its proposal to increase the unloading charges on iron ore. A preliminary hearing was held in the week of March 8 and representatives of the leading ore operators requested that they be given time in which to submit data relating to costs. It also is proposed to increase the unloading charge on coal.

The association is contemplating advancing the charge for unloading ore from the hold of vessel to the rail from 10 to 15 cents a ton, and the charge for handling from rail to dock from 6 to 8 cents. Operators estimate that the increased rate for unloading from hold to rail, on a basis of the anticipated shipments for 1920, will increase their cost $3,000,000. The furnaces in the interior, which pay the charges from rail to furnace, would have to pay an additional $850,000. In the case of the water front furnaces it is said the increase would operate to net them $1,250,000. They have their own unloading machinery and would collect an additional sum from the ore shippers for unloading the ore from the hold to rail, an expense borne by the shipper.

The operators say that if the proposed increase goes in effect it will be unjust to them because they have already contracted to sell the bulk of their shipments in 1920. If to the 5 cent increase for unloading from hold to rail be added 25 cents, representing the increased vessel freight rate, the 10 per cent increase in the wages of mine labor and the additional royalties imposed by reason of the increased selling price of ore, operators claim, comparatively little is left to them from the $1 additional charged for ore this year.

Close Additional Contracts

Cleveland, March 23.—One of the leading operators has closed contracts for 500,000 tons of iron ore, and while business is quiet with most of the operators, contracts for smaller tonnages continue to be written.

While vessel tonnage to move a large block of ore has been taken at the new rate of $1 a ton, net, from the head of the lakes to lower lake ports, inquiry among the vessel operators reveals a great deal of dissatisfaction with the rate. The bulk of the season's tonnage may be moved at this figure, but at present there is a disposition to wait for a higher rate later in the season, and the prospects are that shippers will have to pay more. On the basis of $1 a ton from Ashland, Duluth, Superior and Two Harbors, the rate from Marquette to lower lake ports is 90 cents, net, and from Escanaba 75 cents, net.

Reports indicate that the shipping season will be late in opening.

Steel Corporation Tax Is Less

Lower Earnings Cause Company's Contribution to Government to Dwindle 81 Per Cent from 1918 Total Tax Payment of $274,277,835—Production for Year Averaged 74.5 Per Cent of Capacity—Sales Decline

BUSINESS hesitation in the first part of the year, and labor and transportation difficulties at the close, combined to restrict the output of finished steel products of the United States Steel Corp. in 1919 to 74.5 per cent of capacity and to reduce sales from $1,288,029,255 in 1918 to $1,074,249,645, the annual report of the corporation, just made public, shows. The most significant item of the entire report is the excess profits tax reservation due in 1920 which is estimated at $52,000,000 against $274,277,835 one year before, a total reduction of 81 per cent.

Statistics of Steel Corporation Since Founding

Year	Gross receipts	Net earnings	Balance capital expenditures	Production steel ingots gross tons	Production finished steel for sale net tons	Shipments finished products net tons	Number of employes
1919	$1,448,557,834	$152,290,639	$ 87,091,514	17,200,373	11,997,935	12,243,183	252,106
1918	1,744,312,163	208,281,104	129,855,037	19,583,493	13,849,483	14,124,986	268,710
1917	1,683,962,552	304,161,471	117,977,117	20,285,061	14,942,911	15,370,105	268,058
1916	1,231,473,779	333,574,177	61,680,648	20,910,589	15,460,792	15,542,088	252,668
1915	726,683,589	130,396,011	15,337,431	16,376,492	11,762,639	10,982,748	191,126
1914	558,414,933	71,663,615	23,171,013	11,826,476	9,014,512	9,078,559	179,353
1913	796,894,299	137,121,844	41,999,098	16,656,361	12,374,838	12,168,758	228,906
1912	745,505,515	108,174,673	13,780,361	16,901,223	12,506,619	12,696,935	221,025
1911	615,148,839	104,305,466	49,430,861	12,753,370	9,476,248	9,460,169	196,888
1910	703,961,424	161,054,754	53,101,221	14,179,369	10,733,995	10,727,751	218,435
1909	646,382,251	131,491,414	37,916,259	13,355,189	9,859,660	9,691,290	195,500
1908	482,367,840	91,847,710	49,422,697	7,838,713	6,206,832	7,102,456	165,211
1907	757,014,767	160,964,073	66,981,252	13,099,548	10,376,742	10,451,488	210,180
1906	696,756,926	156,624,273	32,155,146	13,511,149	10,578,433	10,862,425	202,457
1905	535,331,736	110,787,653	24,395,408	11,995,239	9,226,386	.....	180,158
1904	444,405,430	73,176,522	17,957,946	8,406,378	6,792,780	.....	147,343
1903	536,572,871	100,171,152	31,042,135	9,167,960	7,635,690	.....	167,709
1902	560,510,479	133,303,763	16,586,531	9,743,918	8,197,232	.....	168,127
1901	.....	84,779,293	.....	8,854,820	.....	.....	.....

*Before federal taxes.

The net earnings of the corporation before taxes were $204,290,639 as compared with $482,558,939 in the preceding year. Prices received during 1919 for rolled and finished products shipped averaged $6.16 per ton less than in 1918 for domestic shipments and $12.41 per ton less on export shipments, making the combined export and domestic shipments average $7.15 or 8.27 per cent less than in 1918.

Referring to the policy of prices, the report says that the corporation accepted the industrial board's price schedules of March 21, 1919, and had adhered to them ever since, "notwithstanding there has been a steadily increasing cost of operation and production and that the demands of customers for materials would have permitted higher prices." The report adds the following comment on this phase of its policy:

"The decision of the corporation in this particular has been influenced by the heretofore announced reasons which from time to time in the past decided its policy in respect to prices under conditions where the necessities of consumers induce them to bid up prices. At the close of 1919 the unfilled tonnage for rolled steel products was 8,265,366 in comparison with a total of 7,379,152 of Dec. 31, 1918."

The shipments of all classes production in 1919 for both domestic and export consumption compared with the preceding year is as follows:

	1919 Tons	1918 Tons
Domestic		
Rolled steel and other finished products	10,310,729	12,384,169
Pig iron, ingots, spiegel, ferro and scrap	230,560	307,482
Iron ore, coal and coke	1,767,504	1,009,919
Sundry materials and by-products	167,044	192,925
Total tons all kinds of materials, except cement	12,475,837	13,894,495
Universal portland cement (barrels)	9,618,611	7,707,595
Export		
Rolled steel and other finished products	1,932,454	1,740,817
Pig iron, ingots and scrap	86,395	17,120
Sundry materials and by-products	48,157	2,305
Total tons all kinds of materials	2,067,006	1,760,342
Aggregate tonnage of rolled steel and other finished products shiped to both domestic and export trade	12,243,183	14,124,986

Production Is Reduced

Steel production of the corporation in 1919 fell below both 1918 and 1917. Ingot production was 17,200,373 gross tons against 19,583,493 in 1918 and 20,285,061 in 1917. Finished steel production was 11,997,935 while in the previous year it reached 13,849,483 and in 1917 it was 14,942,911. In 1916 ingot output was 20,910,589 gross tons and finished steel 15,460,792 tons.

Total expenditures made by the corporation in 1919 for maintenance, renewal and extraordinary replacements were $114,706,221 which was an increase of 13.26 per cent over the amount expended for these purposes in 1918. Of this sum $88,194,799 was spent on the manufacturing properties, excepting the blast furnaces, against $80,258,444 in the preceding year. Blast furnace relining and renewals consumed the sum of $6,733,245 as compared with $2,549,458 in 1918. The total amount expended since the organization of the company to Jan. 1, 1920, for additional property and construction and for net unabsorbed outlays for stripping and development work at mines equaled $88,301,354. The total amount written off for depreciation and depletion in 1919 was $155,094,033 against $140,671,214 in 1918. Discussing the policy of expansion the report says:

"The expenditures during the year for extensions and construction, particularly in the case of the manufacturing and shipbuilding properties, and to some extent in the other properties, covered very largely work in completing various additions and extensions commenced in the preceding two years, nothwithstanding the comparatively high cost, for increasing and developing capacity to meet the demand for steel products induced by war conditions. At the conclusion of the war in 1918, important extensions and improvements were under way which were primarily undertaken for the reasons stated and many of which were at the solicitation of governmental departments and agencies. It was believed that if prosecuted to their completion these improvements with some changes would in due course of time be required to meet the growing demands on the industry for steel products. Practically no abandonments were, therefore, made of improvements under way, the work being continued to completion of the several units and the cost of the same over what the estimated cost of constructing and installing would have been in the prewar period was charged off to income. During the three years ending Dec. 31, 1919, the aggregate amount absorbed in income and earn-

COMPARATIVE INCOME ACCOUNT

For the Fiscal Years ending December 31, 1919 and 1918

	1919	1918	+Increase —Decrease
EARNINGS—Before charging interest on Bonds and Mortgages of Subsidiary Companies:			
First Quarter	$335 729 326 96	$359 138 031 37	— $23 408 704 41
Second Quarter	36 520 341 16	64 821 521 22	— 28 301 180 06
Third Quarter	42 327 714 21	45 211 708 47	— 2 883 994 27
Fourth Quarter	37 713 256 90	39 109 843 17	— 1 396 586 25
Total for year	*$152 290 639 24	*$208 281 104 23	— $55 990 464 99
Less, Interest on outstanding Bonds and Mortgages of the Subsidiary Companies	8 701 576 71	8 939 424 33	238 847 61
Balance of Earnings	$143 589 062 53	$199 339 679 90	— $55 761 617 38
Less, Charges and Allowances for Depletion and Depreciation applied as follows, viz.:			
To Depreciation and Replacement Funds and Sinking Funds on Bonds of Subsidiary Companies	37 608 819 41	33 117 398 16	+ 4 491 421 26
To Sinking Funds on U. S. Steel Corporation Bonds	7 937 107 01	7 601 425 54	+ 335 681 47
Net Income in the year	$98 043 136 09	$158 631 856 20	— $60 588 720 11
Deduct:			
Interest on U. S. Steel Corporation Bonds outstanding	20 509 320 85	20 891 116 24	— 381 795 39
Premium paid on Bonds redeemed, viz.:			
On Subsidiary Companies' Bonds	119 032 43	70 135 35	+ 48 897 08
On U. S. Steel Corporation Bonds	814 418 93	767 681 25	+ 46 737 68
Balance	$76 600 363 88	$136 902 523 36	— $60 302 159 48
Add: Net Balance of sundry charges and credits, including adjustments of various accounts	194 218 67	629 453 96	— 435 235 29
	$76 794 582 55	$137 532 377 32	— $60 737 794 77
Dividends on U. S. Steel Corporation Stocks, viz.:			
Preferred, 7%	25 219 677 00	25 219 677 00	
Common, {1919, Regular 5% / 1918, Regular 5%, Extra 9%}	25 415 125 00	71 162 350 00	— 45 747 225 00
	$26 159 780 55	$41 150 350 32	— $14 990 569 77
Less: Additional allowance to cover amortization of part cost of facilities installed for production of articles contributing to prosecution of the war		12 215 000 00	— 12 215 000 00
Surplus Net Income	$26 159 780 55	$28 935 350 32	— $2 775 569 77

*Balance of Earnings after making allowances for estimated amount of Federal income and excess profits taxes.

PRODUCTION

OF

BASE, SEMI-FINISHED AND FINISHED PRODUCTS BY SUBSIDIARY COMPANIES IN THE YEAR 1919 COMPARED WITH THE YEAR 1918

PRODUCTS	1919	1918
IRON ORE MINED	Tons	Tons
In the Lake Superior Region		
Mesabe Range	18 603 458	21 574 526
Vermilion Range	797 393	828 994
Gogebic Range	1 575 959	1 916 220
Menominee Range	1 263 092	1 172 319
Marquette Range	346 208	338 344
In the Southern Region		
Tennessee Coal, Iron & R. R. Co.'s Mines	2 436 943	2 522 536
Total	25 423 093	28 332 939
LIMESTONE QUARRIED	5 835 289	5 141 365
COAL MINED		
For use in the manufacture of coke	22 955 636	25 393 155
For steam, gas and all other purposes	5 937 487	6 354 980
Total	28 893 123	31 748 135
COKE MANUFACTURED		
In Bee-Hive Ovens	5 933 056	9 562 403
In By-Product Ovens	9 530 593	7 795 233
Total	15 463 649	17 757 636
BLAST FURNACE PRODUCTION		
Pig Iron	13 481 738	15 200 561
Spiegel, Ferromanganese and Ferrosilicon	155 766	240 393
Total	13 637 504	15 940 954
STEEL INGOT PRODUCTION		
Bessemer Ingots	4 788 242	5 630 246
Open Hearth Ingots	12 412 131	13 953 247
Total	17 200 373	19 583 493
ROLLED AND OTHER FINISHED STEEL PRODUCTS FOR SALE		
Steel Rails (Heavy and Light Tee and Girder)	1 361 358	1 471 568
Blooms, Billets, Slabs, Sheet and Tinplate Bars	975 020	1 489 737
Plates	1 578 360	2 171 362
Heavy Structural Shapes	855 118	1 079 601
Merchant Bars, Hoops, Skelp, Light Shapes, Etc.	2 270 711	2 139 279
Tubing and Pipe	1 192 582	1 150 594
Wire Rods	161 053	200 359
Wire and Wire Products	1 438 439	1 445 567
Sheets (Black and Galvanized) and Tinplates	1 381 515	1 356 119
Finished Structural Work	351 704	503 380
Angle Splice Bars and All Other Rail Joints	188 707	145 305
Spikes, Bolts, Nuts and Rivets	39 009	67 514
Axles	75 494	141 480
Steel Car Wheels	36 946	84 333
Sundry Steel and Iron Products	91 919	334 396
Total	11 907 935	13 849 483
Spelter	45 949	41 715
Sulphate of Iron	35 197	42 321
Fertilizer—"Duplex Basic Phosphate"	24 430	12 022
	Bbls.	Bbls.
Universal Portland Cement	9 112 000	7 287 000

ings for excess cost of construction outlays over the estimated prewar period cost has been $120,297,854."

The balance sheet of the corporation shows that it is in a remarkably strong financial position with a net working capital of $515,224,125 as compared with $485,354,599 as of Dec. 31, 1918. The larger showing of net working capital results from the reduction in the item of "accrued taxes" from $288,078,865 to $70,574,345 included in current liabilities. Total current liabilities because of this change were $157,071,263 against $397,781,482 one year before.

Current assets likewise fell from the $883,136,081 of one year ago to $672,295,388. It is significant that inventories are shown to have dropped from $274,753,600 in 1918 to $226,796,678. Marketable securities held by the corporation have dwindled from $277,745,969 to $159,069,671. The corporation on Dec. 31 had in its possession $326,666,283 in cash, time deposits and marketable securities against $467,522,035 one year before. On the liability side accounts receivable are seen to have increased from $88,192,692 in 1918 to $113,810,679, which may reflect the tight credit situation.

The net property account of the corporation as carried in the report is $1,578,661,546 against $1,563,937,122 one year before. The total bonded debenture and mortgage debt as of Dec. 31 was $568,899,084, a net decrease during the year of $13,921,885.

The average number of employes in the service of the company was 252,106 against 268,710 the preceding year, but the total of salaries and wages paid was $479,548,040, a striking increase over the $452,663,524 in 1918. The average salary or wage per day per employe in 1919 was $6.17 which compares with $5.38 in 1918.

Coke Control

Removed By President's Order But Lever Act Is Held in Reserve

Washington, March 23.—Effective April 1 government restrictions as to coal and coke, except those relating to export of coal, were removed by an executive order issued today by the President. The control of export coal, exercised by the Tidewater Coal Exchange will be removed April 30, in accordance with an executive order of March 5. The executive order of today, issued in connection with the President's acceptance of majority report of the coal commission granting a 27 per cent wage advance to the miners, removes maximum prices on coal and coke as well as authority to confiscate coal and divert cars and all other powers of the fuel administration under the Lever act with exception as to coal export. These powers are suspended but the Lever act will not be repealed so that its status on April 1 will be the same as that existing prior to the executive order of Oct. 30, 1919, when the fuel administration, owing to the coal strike, resumed authority.

The majority report of the coal commission estimates the wage advance at $200,000,000 annually, the 27 per cent increase being substituted for the 14 per cent increase allowed by former Fuel Administrator Garfield. The president in making the reports public addressed a letter to the operators and miners asking that they reach an agreement on basis of the majority report alone so that the uncertainty of the fuel situation be removed and that consumers be able to make contracts for coal supplies. The President said he assumed neither party would raise the question and that he was sure none could be properly raised as to the binding character of award by majority of the commission although the report not unanimous. The President also warned the operators against violating the laws through combination in restraint of trade and through profiteering and urged them not to ask unreasonable prices. He indicated such violation of practices would result in the powers of the Lever act being restored.

Third Quarter Steel for Export

Big Interests Offer Plates, Bars and Tin Plate to Exporters for Shipment After July — Foreign Customers Advised to Hold Off for Lower Prices — Big Rail Inquiry from China

NEW YORK, March 22.—Owing to their inability to obtain contracts with the mills for steel in any quantity and upon any stable basis, iron and steel exporters have been advising their foreign inquiries that no business at this time can be entered into. One house that has done a large business in the past has adopted a form letter which is sent to customers abroad. The letter reads:

"We beg to acknowledge receipt of your esteemed favor, and appreciate the opportunity you have given us of quoting on your inquiries.

"The recent steel strike has caused a great shortage of material, and deliveries are very uncertain. For this reason, we believe we can better serve the interests of our friends by withdrawing from the market until such time as conditions improve.

"We shall, however, keep your inquiry before us, and later on hope to again revert to this matter."

Spot deliveries only can be made during the first quarter and there is none of this business at this time. No second quarter tonnage of any consequence is available, this being limited to such over-run lots as the mills might find on their hands at the time of production. Until recently there was no contracting for third quarter business, although within the past week a change in this situation has been noticed. Gradually third quarter business is coming out and it was announced that the Consolidated Steel Corp. has given notice to some of the exporters that it is prepared to take on orders for plates, bars and tin plate for third quarter. In its notice to the trade last week the Consolidated company gave notice that it could not offer plates any thinner than ¼ inch for third quarter and that if any thinner dimensions are specified it must be put through on a sheet basis, and its tin plate offerings will be limited. The prices, were not indicated this being left to the confirmation by the constituent mills.

The sheet scarcity is tremendous. It was reported that in the Dutch East Indies there appears to be a larger stock of corrugated sheets and owing to the scarcity of plain sheets there native hand labor is being used to hammer out the corrugations. In answer to inquiries for sheets, one export house has been replying with the following cable:

"Out of the market on sheets. Willing to book for third quarter at price then prevailing."

As an evidence of the scarcity of sheets and the tremendous foreign demand, a case was cited where a mill proposed to sell 2000 tons of black sheets at 10.50c, Pittsburgh. These were for April delivery.

The price problem has been restricting business. While Japan and the Orient continue to buy in this market, they no longer are offering heavy premiums, and South America is holding back in anticipation of a reduction in costs.

It is learned that bars for third quarter can be had at 4.00c, Pittsburgh. The price on galvanized sheets is arbitrary, although some have been sold for 9.00c. Upon attractive specifications plates can be contracted for at 3.75c, Pittsburgh, but tin plate is selling for $11 a base box.

Export houses make varied reports. One house says that no new bookings have been made, whereas another states that its business for February was better than for any month during the past 16, and that its March business will be about double its February business. This house reported the sale of 3000 tons of bars to the Dutch East Indies, Japan and South America within the past week; 2000 tons of rods to Japan; 20,000 base boxes of tin plate to Japan, Belgium, Australia and South America; 1000 tons of pipe to South America and Europe, a quantity of galvanized wire to Japan and Australia and some plates to Japan.

The more conservative exporters have abandoned hope completely of doing further business with Europe. They say it is futile to attempt to meet the restrictions placed on such trading. With the exception of some pig iron and a little miscellaneous business the doors of Europe seem closed. Italy inquired last week for 15,000 tons of pig iron and there is a bare chance that it may be filled. One dealer closed over 1000 tons of pig iron for Europe, subject to financial arrangements. Other negotiations pending include 4000 tons of foundry and 5000 tons of basic iron. Foreign business in this product is looming up substantially owing to the stronger European market and more favorable exchange rates. It is estimated that requirements which might find acceptance here aggregate considerably over 125,000 tons, of which one-third are in basic iron.

The Cuban demand has been tremendous. The Baldwin Locomotive Co. has booked orders for 20 locomotives for Cuba and another house reported selling Cuba two locomotives last week together with 350 cane cars. This is business based upon the sugar industry which at this time is extremely prosperous. Cuba purchased 1500 tons of heavy rails last week and has been inquiring for 600 tons of light rails. The heavy rails sold for $55, New York.

One furnace closed some South American business for pig iron on the basis of $42, Birmingham. The business represented several orders in several hundred ton lots. In the South American market, the most consistent inquiries continue to pour in from Brazil, which already has consumed considerable rails and is calling for more. Brazil is in the midst of extensive railroad improvements, extensions and constructions. It has also been buying bars, plates and like material. Chile has purchased tanks and an assortment of fabricated material.

Some little business continued with India but it is understood that the English are gradually taking back that market from the United States. The Oriental business continues in pleasing volume, despite the fact that the Japanese no longer are running up the cost of material by offering unheard-of premiums for early delivery. Japan has been asking for tin plate and has been successful in buying but little. Japan has also been asking for plates and obtaining some.

The most important development in the market last week, aside from the decision of the Consolidated company to sell certain products for third quarter, was the receipt of a Chinese inquiry for 20,000 tons of 80-pound rails. China is engaged actively in railroad work and mining and these rails, it is understood, are intended for some new railroad development.

British Prosperity on Increase

Industrial Conditions Continue to Increase Despite High Prices and Scarcity of Iron and Steel — Pig Iron Demand Huge — German Steel Districts Paralyzed by Revolution Says Special Cable to The Iron Trade Review

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent St., S. W. I.

Sterling—$3.77

LONDON, March 23.—British prosperity is growing despite the high prices which are prevailing. Makers could sell ten times the present pig iron output. Many foreign inquiries are being refused. Middlesborough makers virtually have closed their books for export. Small lots have been sold for export at £12 10s ($47.13) No. 3 grade and at £14 ($52.78) for hematite. The German exports which have been of insignificant volume have been totally stopped except from occupied territory.

British automobile machinery and railroad equipment manufacturers are clamoring for steel and are sounding the American market. Following the recent rise in sterling William Beardmore Co. of Glasgow has taken orders for 90 locomotives from London Northwestern railroad. Using the shops originally built to make artillery for the United States armies, for this purpose. The minimum export quotation on standard ferromanganese is £35 ($131.95) with some anxious buyers paying as much as £50 ($188.50).

With available tonnage only about one-half of the current requirements consumers are trying to get American billets and wire rods. The latter have been advanced to £32 ($120.64) and skelp to £30 ($113.10). A loss of production of 500,000 boxes through the Welsh strike is causing anxiety because of the heavier European offerings of American Tin Plate.

Another crisis in French industry results from the German coal strike.

The special correspondent of the Iron Trade Review at Dusseldorf, Germany telegraphs the following: "A general strike throughout Germany except for the occupied territory is continuing. No means of communication whatever is available. All steel works, mines and transportation lines are idle. Production of the Westphalian steel district, Germany's Pittsburgh, is stopped entirely. Some blast furnaces are banked, others are freezing. The Krupp's plant at Essen is shutdown. The Deutsche Luxembergische plant at Dortmunds and others are idle, while the bolshevists control the east bank of the Rhine. After heavy fighting, loyal troops are reported impossible to predict when work will be resumed. A loss of at least a month's production is unavoidable.

Production of pig iron in Great Britain in January amounted to 665,000 tons, as compared with 661,000 tons in January, 1919, and an average monthly production of 617,000 tons last year. Production in January, 1920, was classified as follows: Hematite, 240,000 tons; basic, 229,000; forge and foundry, 180,000, and alloys, 16,000. The output of steel in January, 1920, amounted to 754,000 tons, as compared with 718,000 tons in January, 1919, and a monthly average of 658,000 last year.

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling $3.45

BIRMINGHAM, Eng., March 5—Advances were made this week in nearly all grades of pig iron and steel. Scotch iron led the increase a few days ago with a rise of £1 ($3.45) per ton, and today the Scottish steelmakers advanced prices of their finished material £2 ($6.90), including boiler plates, ship plates, angles, joists, forging blooms, and slabs. The increases are due chiefly to the shortage of supplies, Scotland being unable to get sufficient ore. English prices have been advanced £1 ($3.45) and upward for most descriptions of steel, but this advance is generally considered insufficient, in view of the great increases in prices of semifinished material.

Pig iron has advanced on account of the fuel scarcity. The deficient coke supply is a serious factor. In the west of England, including Barrow and Cumberland, one furnace has had to be damped down, and several have been put on slack blast for want of coke. Barrow has a number of very efficient furnaces which could be started if coke were available. The coal controller is being urged to stop all coke export licenses, but he has not yet decided on such a drastic step. In the Midland district, the urgent protests against excessive exports of coke have had some effect. The coke makers and blast furnacemen conferred with the result that coke was advanced 5 shillings (86 cents). This was considered comparatively moderate, and as far as the Midlands are concerned, the increase was promptly passed on to the buyer of pig iron. Northamptonshire prices also have been advanced 5 shillings as of March 1, and will be increased 7 shillings ($1.20) more April 1. Derbyshire iron also is likely to be increased. South Staffordshire irons are advanced 7 shillings 6 pence ($1.29) for March sales, and 5 shillings (86 cents) for April. The advances have not brought more iron on the market, and it is extremely difficult to get contracts booked.

Cleveland makers have not taken action. They are credited with a desire to discourage the upward movement, but circumstances are likely to prove too strong for them, especially in regard to hematite. Increasing cost and great scarcity of foreign ores is becoming a serious trouble. The freight rates on ore from Bilbao to Middlesborough were advanced this week to £1 19s ($6.73). The price of the ore also has been increased, so that the material now costs £3 12s ($12.41) per ton, delivered at the River Tees. Still more serious is the fall in tonnage. During February the amount of ore imported into the Tees was 87,432 tons, against 124,497 in January. Consumers have very little ore in stock. There is a general belief that East Coast hematite will have to be increased in price. Shipments of Cleveland pig iron are small, although a thousand tons more were sent out in February than in January. The number of furnaces blowing in that district is 66. A number of others are ready to be started when coke and ore can be obtained.

Buyers rather welcome the increased

Current Iron and Steel Prices of Europe

British Market

Domestic and Export. Gross Tons at Works

SEMIFINISHED STEEL

	£ s d	$
Billets, soft steel	25. 0.0	94.25
Sheet bars	32. 0.0	120.64

FINISHED STEEL

Steel bars, England, ¾ to 3 inch	28.10.0	107.45
Ship plates, England	23.10.0	88.60
Ship plates, Scotland	24.10.0	92.37
Beams, England	22.10.0	84.83
Beams, Scotland	23.10.0	88.60
Sheets, black, 24 gage	45. 0.0	169.65
Sheets, galvanized, 24 gage	53. 0.0	199.81
Rails, 60 lbs. and over	21. 5.0	80.11
Tin plate, base box, 108 lbs.	4. 0.0	15.08

PIG IRON*

Hematite, East Coast Mixed Numbers	13. 0.0	49.01
Hematite, Scotch	10.10.0	39.59
Middlesborough Basic	10.17.6	41.00
Middlesborough No. 3	10. 0.0	37.70
No. 3 Foundry, Derby, Leicester, Nottingham	10.13.0	40.15
No. 3 Foundry, Northamptonshire	9.17.6	37.23
No. 3 Foundry, Staffordshire	10.12.6	40.05
Scotch Foundry	11.10.0	43.35
Ferromanganese, 80 per cent	32.10.0	122.53

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiation.

COKE

Yorkshire furnace	2.13.6	10.08
Yorkshire foundry	3. 6.0	12.44

French Market

PIG IRON

	Francs per metric ton (2205 lbs.)	$
No. 1 Foundry, Longwy (silicon 3 per cent)	450	31.50
No. 2 Foundry, Longwy (silicon 2 per cent)	430	30.10
Hematite	520 to 540	37.13 to 38.56

COKE

French foundry	140	10.00
British, German or Belgian foundry	160	11.42

ROLLED STEEL

Semifinished steel	650	46.41
Beams and profiles	850	60.69
Rails	880	62.83
Plates	1050	74.97

Pig iron quoted at furnace; coke, f.o.b. at ovens, or at French ports; rolled steel, at makers' works.

Belgian Market

PIG IRON

	Francs per metric ton (2205 lbs.)	$
No. 1 Foundry (silicon 3 per cent)	625	44.63
English hematite (c.i.f. Antwerp)	600	42.84

FINISHED MATERIAL

	Francs per 100 kilos (220 lbs.)	$
Plates, 3 millimeters	150	10.50
Plates, 3 to 5 millimeters	135	9.35
Plates, over 5 m/m	120	8.57
Beams	90 to 95	6.30 to 6.65
Sheets	175	12.50
Iron bars	100	7.00

Pig iron quoted at Belgian furnaces, except English hematite; semifinished steel at works, and finished material delivered.

prices because they believe that the higher prices bring more material into the market. Cleveland makers actually have been urged to put up prices, and they were undersfood to be keeping pig iron back, waiting for a rise. The makers, however, positively deny that they have any reserves. They say that the question is one of output and not of price.

Cleveland No. 3 continues at £8 15s ($30.28), with 5 shillings (86 cents) extra for France, Belgium and Italy. But for the small quantities sent to other destinations abroad, as much as £11 10s ($39.67) is being paid. Belgium is the largest buyer.

The position with regard to finished iron is extremely confusing. While unmarked bars are listed at £24 10s ($84.52), it is very well known that £27 ($93.25) to £28 ($96.70) is being paid. For gas strip, the premium is at least £3 ($10.35) to £4 ($13.80) on the list price. It is almost impossible to get a quotation for small bars, owing to the varying prices of billets. The nominal figure is £22 ($75.90), and the steel manufacturers have not thought it worth while to withdraw this, but at Birmingham none of the selling agents will book orders, in view of the steel strike in South Wales. Inquirers, however, were told that while all offers must be submitted to the steelworks, they would certainly not be entertained at any figure below £25 ($86.25). Sellers of small bars have postponed quoting until they know the price they have to pay for billets. It is announced, however, that steel bars for export have been advanced £1 10s ($5.17) making them £30 ($103.50), and bright steel bars a similar amount, raising them to £36 ($124.20). Steel sheets were recently put up £3 10s ($12.07) making them £33 ($113.85) for ⅛-inch stock.

Prices Are Not Stable

Ferromanganese is £2 10s ($8.62) higher, the new selling figure being £32 10s ($112.12). None of these prices can be regarded as stable, the upward tendency still being very pronounced. Most ferroalloys are tending upward. Ferrovanadium has been advanced £2 15s ($9.48). This material could be bought for 12 shillings 6 pence ($2.15) before the war. The explanation given in Sheffield for the high price is that America has a monopoly of the sources of supply. But it is admitted that the rate of exchange has an adverse effect on the present position.

The worst effects of the steel famine are felt in the semifinished departments. Many rerolling mills are idle. Tin plates and sheet bars have reached £30 ($103.50) and buyers consider themselves highly favored to get their orders accepted at this rate. A few fortunate buyers of American steel have been cheered by intimation of arrivals at the port of Liverpool. This by no means eases the situation although the buyer has the prospect of making a good profit when the steel reaches the mill. Some buyers who paid for their steel at the end of January on the bill of lading, this being customary when the steel reaches the port, are still vainly inquiring for the material. The railways are terribly congested, and for two days last week the London and North Western railway closed every depot against traffic with the object of clearing off all arrears before making a new start. The congestion, however, is as severe as ever. It is stated on good authority that at least 80,000 tons of steel are on the loading platforms of the various northeastern steelworks awaiting cars.

The tin plate trade and galvanized sheet trade are completely paralyzed by the Welsh strike. Galvanized sheets have been sold at £60 ($207) in Scotland and selling prices range downward to £52 ($182.80) according to circumstances. It is next to impossible, however, to get orders accepted.

Sales of tin plates have been made at Swansea at £3 13s ($12.58) as a basis, but some sellers are asking £3 15s ($12.93). It is reported that America has sold 40,000 boxes to France, and that 500 boxes of American plates have arrived in London. Welsh makers, however, discard any idea of serious American competition, declaring that the latter are booked, in many cases, until the end of the year.

Shipbuilding yards are extremely busy, and from Italian inquiries it is understood that Italy is looking to this country to help her to increase her mercantile marine by 2,000,000 gross tons. The provisional program provides for regular delivery during the next six years, but it is not decided who will get the order.

The proposal of the Birmingham tramways committee to accept the tender of the United States Steel Products Co., for the supply of 3000 tons of tramway rails was unanimously approved by the Birmingham city council March 2. The chairman of the tramways committee said it had no alternative but to buy the rails from America.

Longwy Foundry Iron Advanced $1.75

Value of Franc—$0.07

PARIS, March 6.—A little more activity was noted in the iron and steel market during the past week, following the recent lull, and several price changes were made in upward direction. Longwy No. 1 foundry iron (3 per cent silicon) was advanced from 425 to 450 francs ($29.75 to $31.50) furnace, while Longwy No. 2 foundry (2 per cent silicon) was increased from 405 to 430 francs ($28.35 to $30.10), furnace. The dollar rate of exchange is substantially the same as a week ago.

The Paris Consortium of Iron and Steel Dealers is quoting the following prices per 100 kilos (220 pounds) on warehouse stocks: Merchant steel, 120 francs ($8.40); sheet bars, 135 francs ($9.45); beams and profiles, 115 francs ($8.05); U beams, 120 francs ($8.40); plates, 5 or more millimeters, 136 francs ($9.52); sheets, 2 or less millimeters, 154 to 156 francs ($10.78 to $10.92); finished plates, 189 to 199 francs ($13.23 to $13.93); steel bars, rounds, 170 francs ($11.90); squares, 190 francs ($13.30); hexagons, 193 francs ($13.51); blue annealed sheets, 106 to 150 francs ($7.42 to $10.50).

The quotation on tin plate, per case of 112 sheets, or 180 pounds, is 150 francs ($10.50), although actual sales are being made at from 100 to 200 per cent over the above this figure.

Metallurgical Position of France Assured

What the return of Alsace-Lorraine to France means from a metallurgical standpoint is to be read from statistics on iron ore production and blast furnace capacity, says a review of economic conditions. In 1913, the year before the war, the entire iron ore production totaled 21,918,000 tons, practically all or 18,601,000 tons of it coming from the Meurthe and Moselle districts or the basins of Briey, Longwy and Nancy. During that same year, the basin of Thionville on the left bank of the Moselle in Alsace-Lorraine, produced 20,536,000 tons. Of the 282,250 acres of ore and coal lands situated in Alsace-Lorraine, Belgium, France and Luxembourg, 107,500 acres are in Alsace-Lorraine.

Much of ore mined in Lorraine before the war, was consumed in that territory. In 1913, 11,177,000 tons of Lorraine's total ore production was consumed on the spot by various metallurgical industries. The remainder was exported to Luxembourg, Westphalia, France and Belgium.

Before the war, the metallurgical industries of Lorraine owned 60 blast furnaces, eight along the frontier of Luxembourg, 25 between Thionville and Fontoy, and 27 to the south and southeast of Thionville. The blast furnaces and steel mills of Lorraine produced in 1913, 4,165,000 tons of pig iron, 2,100,000 tons of bessemer steel, 185,000 tons of open-hearth steel, and 682,000 tons of semifinished steel and iron products, and 1,240,000 tons of rolled metal. France's production during the same year did not exceed 5,207,000 tons of pig iron, and 5,092,000 tons of steel. Alsace-Lorraine therefore alone furnished a pig iron tonnage equal to 4/5 of France's production, and about 50 per cent of her steel production.

Fight Tonnage Tax

Duluth, Minn., March 22.—Directors of the Minnesota Fair Tax association decided at a meeting today to begin a membership drive on April 27 throughout northern Minnesota. An attempt will be made to enroll 50,000 members for an educational campaign to be conducted throughout the state, particularly with the view to demonstrating that a tonnage tax on iron ore, such as was vetoed by Governor Burquist during the last session of the state legislature, would be unfair and harmful to the iron mining industry.

Will Increase Capital

Permission to increase its capital stock from $3,000,000 to $10,000,000 has been granted the Warner & Swasey Co., Cleveland, manufacturer of turret lathes, automatic screw machines, etc., by the secretary of state of Ohio. While no program of expansion has been outlined as yet, Vice President Frank A. Scott stated that this step was taken so that when the business requires, the company will be ready to increase its capital.

Hold First Meeting

The first meeting of the reorganized Standard Parts Co., Cleveland, which recently took in the Eaton Axle Co., was held in that city, March 22. It was decided by the new board of directors to defer payment of the preferred dividend, payable April 1, until permanent financing has been completed and that regular preferred dividends should then be resumed promptly.

New officers of the company are: J. O. Eaton, president and general manager; John Younger, vice president and assistant general manager; D. C. Swander, vice president and director of sales; T. E. Borton, treasurer; P. A. Connoly, secretary; R. C. Hyatt and H. J. Douglas, assistant secretaries. The board consists of J. O. Eaton, John Younger, W. H. Prescott, T. E. Borton, Cyrus S. Eaton, H. P. McIntosh, Maynard H. Murch, R. C. Hyatt, C. I. Ochs, F. R. White, P. A. Connoly, E. J. Hess, E. A. Petrequin, W. E. Bock, T. H. Jones.

John Younger, assistant general manager, formerly was chief engineer of the Pierce-Arrow Co., and later manager of the automobile division of the Standard Steel Car Co.

It also was officially announced that the company has more orders booked than ever in its history.

Study Effect of Heating in Vacuo

When Polished Metal Specimens Are Heated in Vacuo, Record of Structure Existing at the Particular Temperature Used Is Inscribed on Polished Surface of Specimen

REPORT of the results of test made of the microstructure of iron and mild steel at high temperatures was given in a paper prepared by Henry S. Rawdon and Howard Scott for the February meeting of the American Institute of Mining and Metallurgical Engineers, held in New York. The authors are physists, bureau of standards, Washington. The paper calls attention to the fact that the method of demonstrating the structure existing in a metal or alloy at high temperatures, by etching a polished sample after it has been heated to the desired temperature, is quite familiar to metallographists. The usual procedure is to heat the specimen, previously polished for microscopic examination, to the desired temperature, in a neutral atmosphere, hydrogen or nitrogen, then admit the etching gas, chlorine, hydrochloric acid or similar gas, for a few seconds, and finally, after flushing out the etching gas with the neutral one, cool the specimen in the neutral atmosphere. The pattern produced by etching at a definite temperature is usually taken as a record of the microstructure prevailing at that temperature. It has frequently been pointed out that changes in composition of the surface metal occur during the preliminary heating in the neutral atmosphere, so that the appearance produced by the etching at high temperature may not exactly represent the condition of the interior of the specimen. To overcome this uncertainty, the heating has sometimes been done in vacuo, the etching gas being admitted when the desired temperature was reached, then pumped out and the specimen cooled in vacuo.

Heating in Vacuo

The studies of Rosenhain, Humfrey, and other workers demonstrate that surface changes iff the steel occur even when the specimens are heated in vacuo. Such changes in themselves are sufficiently pronounced to record, in the appearance of the surface, the microstructure prevailing at the temperature at which the change took place. The surface configuration or pattern thus produced, to which various names, "heat-relief" "heat-etching" and "vacuum etching," have been applied, has been explained by Rosenhain as being due to volatilization of the surface metal. This is more marked along the crystal boundaries than over the face of the crystal itself. The change in composition of the layer immediately adjacent to the surface of a steel sample when heated in vacuo or in a neutral atmosphere has also usually been attributed to volatilization. Howe has offered an entirely new and striking explanation for this phenomenon, namely, that the change in composition of the surface layer is only local and the average composition of the specimen does not change. Upon cooling a sample of steel from a high temperature, the free constituent, ferrite or cementite as the case may be, is expelled to the outside of the mother austenite crystal and thus to the surface of the specimen in those crystals which form the exterior. By repeated heatings, the layer of expelled ferrite, in the case of low-carbon steels, is augmented until the specimen has the appearance of being decarburized at the surface.

The examinations here described were made for the purpose of showing to what extent the change in composition of the surface layer, which usually accompanies heating in vacuo, affects the results of tests which may be made to reveal the microstructure existing at high temperatures. The results also throw some additional light upon the nature of the change in composition of the surface layer and also upon the formation of the surface pattern under *heat-relief* etching.

Pure iron and low-carbon steel were chosen as typical materials for demonstration, since both materials show pronounced changes in structure accompanying some of the transformations which occur upon heating. Micrographs were shown of samples heated to different temperatures and under different conditions.

It may properly be asked, the authors state, to what extent the etching indications of steel at high temperature vitiated by changes of composition that occur in the surface metal upon heating. The results previously described show that no decarburization below the temperature of the A_3 transformation can be detected. This is due to the physical form in which the carbon exists; not until the carbon, as carbide, is in the state of a solid solution in the iron, *i.e.*, above A_1, is there any appreciable change in the exposed surface metal. Below the A_3 transformation, the carbon occurs in the form of a definite crystalline compound and the loss upon heating may be entirely neglected.

A very marked change, however, occurs upon heating a specimen just above the A_3 transformation, when the carbon passes from the form of crystalline cementite to a solution, of cementite, in the iron. In this form it quite readily volatilizes from the surface, so that a pronounced carbonless layer is soon formed in specimens of low-carbon steel that are held for periods no greater than 30 minutes at this temperature. The method of *heat-etching*, however, serves to record the structure both before and after the change has taken place. The pronounced differential expansion of pearlite and ferrite at the A_3 transformation will account partially for this. The fact that at temperatures below A_3 the structure is clearly revealed by heat-etching, however, shows that this is not the sole cause, but that the slight general volatilization which occurs, together with the slight differences in the rate of thermal expansion of pearlitic steel and iron ferrite are sufficient to record clearly and definitely the structure of the metal. The volatilization of iron is sufficiently pronounced at the crystal boundaries to show them clearly, but across the face of the crystals there is very little loss, as is proved by the persistence of slip-bands, upon heating. That the ferrite is changed somewhat, is shown by its increased tendency toward oxidation. Upon slight etching with nitric acid, a distinct oxide film readily forms, coloring the ferrite very dark.

Show Carbonless Layer

Specimens heated to temperatures higher than the A_3 transformation show a carbonless layer, which becomes thinner as the temperature is increased. This is properly to be attributed to the increased rate of diffusion of carbide in iron, by which the change at the surface is masked. The results obtained by etching specimens at the higher temperatures are more truly indicative, therefore, of the structure of the interior than those at lower temperatures, *e.g.*, just above A_3. That the loss of iron by volatilization across the face of the crystals is very slight, even at high temperatures, is proved by the persistence of the slight roughening due to preliminary etching throughout the en-

tire period of heating. The loss by volatilization is of a magnitude sufficient to show the crystalline structure by the production of etching pits; at the crystal boundaries the loss is much greater. In addition, the carbide is removed to an appreciable depth on all the exposed faces of the specimen.

It has been found that when polished metal specimens are heated in vacuo, a record of the structure existing at the particular temperature used is inscribed on the polished surface of the specimen. This record consists of a slight roughening due to volatilization and to a slight *buckling* of the surface, due to the volume change accompanying the transformation. The terms "heat-relief," "heat-etching" and "vacuum-etching" have been applied to this method of developing the microstructure.

By means of heat-relief the structure of iron and steel at high temperatures is readily revealed. This is a much simpler method than the high-temperature etching often used. It appears probable that much of the effect usually attributed to etching at high temperature is due to the heating itself.

An appreciable change of composition and structure of the surface metal occurs in steel, upon heating. This is strongly marked just above the A_1 transformation, and becomes less so upon heating to higher temperatures, due to the increased rate of diffusion of carbon, as carbide, in iron. The structure revealed on the surface by heat-relief, or by high-temperature etching, is less representative of the interior at temperatures just above the A_1 transformation than at any other temperatures.

The change in composition of the surface layer of steel heated to high temperatures in vacuo is to be explained as due to volatilization of the carbide. No appreciable change takes place until the carbide enters into solid solution in the iron, *i.e.*, above the A_1 transformation.

The volatilization of iron from the surface, upon heating, is slight. Polished specimens of iron and steel, etched before being heated, retain the slight roughening due to the etching, even after pronounced heating. The volatilization of iron at the crystal boundaries is much more rapid than across the face of the crystal.

The Cleveland-Duplex Machinery Co., 1224 West Sixth street, Cleveland, celebrated its second anniversary, Friday, March 19, the number present being double that which attended the meeting a year ago. The occasion was featured by a banquet and theater party with a supper following. Reports were read which indicated a very successful year.

Screw Thread Committee to Continue Work

The senate has passed a joint resolution to continue for two years from March 21, 1920, the national screw thread commission. The resolution previously had passed the house.

The commission, appointed under the authority of an act approved July 18, 1918, was created to investigate, formulate and after investigation, test and, upon approval, promulgate standards of commercial screw-thread practice. It is composed of two representatives of the army, two representatives of the navy and four civilians, nominated by the engineering societies of America with Dr. S. W. Stratton, director of the bureau of standards, as chairman. The commission has practically completed its work which is of a wide and far reaching effect. A tentative report was proposed three months ago, which has been made accessible to the engineering and manufacturing industries and which has been subjected to the final test of actual use. The work of the commission is being accepted with satisfaction by the industries concerned, but in few instances it has been found by actual practice that slight adjustments or variations in certain particulars of the standards submitted should be made before the report in its final form is promulgated and the life of the commission terminated. It therefore is believed that it is necessary to keep the commission in existence for two years more, so that it may pass upon any questions of adjustment or modifications of the proposed standards.

The members of the commission serve without compensation other than the regular salary of the army and navy members and of the director of the bureau of standards. The commission has incurred no expense to the government and none is contemplated as a consequence of the extension of time.

Awards New Buildings

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has awarded the contract to Westinghouse, Church, Kerr & Co. for four new buildings at South Philadelphia, for the housing of the machine works, which are to be removed from East Pittsburgh. The new buildings comprise a light machine shop, one story, 130 x 500 feet, to be used in building small turbines for operating pumps and generators; a machine shop 130 x 700 feet for making large land and marine steam turbines, an erecting shop 300 feet long, which will join the machine shops and a 3-story warehouse 50 x 600 feet. The top story of the latter building will be used for manufacturing purposes. Buildings will be of terra cotta and steel construction and will be of similar design and construction of machine shops Nos. 1 and 2, already up. Most of the machinery necessary for production will be transferred from East Pittsburgh and will be motor-driven, thus eliminating overhead shafting.

Opposes Italy's Buying from United States

Problems of exchange and present conditions in Italy's industries are covered in an open letter, published by Pie Perrone, president of the Ansaldo Co., Genoa. In it he opposes the efforts which are being made to encourage trade with the United States, particularly in the matter of purchases. American government officials in Italy have sent copies of this letter to the United States from which the following has been abstracted:

The administration, probably because it is under the influence of skillful intermediaries, with their experience in commerce so varied and of such great proportions, does not see the danger and the damage of applying exclusively to countries where sales organizations are formidably constituted, reaching almost a monopoly of the products. Thus the state sees no other seller than the United States and from that market, for the greatest part on credit, obtains enormous quantities of goods of all sorts. It is natural, therefore, that the exchange of the Italian lire with the American dollar should reach hyperbolical heights.

A large part of the natural products necessary to Italy, particularly those which constitute the greatest part of our imports, such as grain, coal, mineral oils, etc., can be obtained from countries nearer to us, where organizations do not exist for the purpose of exploitation and where the prices are lower. With these countries the rate of exchange is more favorable to us and from them the freight rates are lower, as for example, the Black sea regions.

Here we would have opportunity for real economic exchanges and we would pay for the products with our manufactured goods and thus open the way for our commercial expansion in those vast markets which can offer in the shortest time, through their natural richness, the broadest field for our activity. By this method, which can be followed in other directions as well, can a sensible, gradual and continual improvement of our currency be obtained.

Capt. G. C. Molleson, of the engineering department of the army air service, is in Americus, Ga., superintending the permanent storing of 700 airplane motors in the aviation warehouse at Souther field.

Selecting Motors for Mill Drive

Layout of Units and Method of Rolling in Various Types of Mills Affect Load Cycle from Which Motor Capacity, Size of Flywheel and Method of Control Are Determined

BY J. D. WRIGHT

IN SELECTING electrical equipment for driving the main rolls of various types of mills, engineers are influenced by the layout of the mill and the method of rolling steel. These factors affect the load cycle from which the motor capacity, size of flywheel, type of control, etc., are determined.

One of the simplest of the large motor applications is to a continuous mill such as a 6-stand continuous sheet bar or billet mill built by the Morgan Construction Co. A mill of this type receives its steel in the form of a bloom having a section around 6 x 7 inches direct from a blooming mill. The size of the bloom will of course vary with the size, number of stands and product of the continuous mill, but a 6 x 7-inch section is typical.

Since the stands of the continuous mill are spaced with only a few feet between centers the load builds up to the maximum in a series of steps, the successive step representing the entrance of the steel into successive stands. Since the bloom is fairly long the steel remains in all stands for a considerable number of seconds. The reason for stating that a continuous mill drive represents one of the simplest of the large motor applications will be evident from the load, which comes on in several easy steps and remains on for some time. The motor is not subjected to shocks caused by sudden high peak loads. Therefore, no flywheel is required. Since no flywheel is used the motor has only the friction load of the mill when starting under normal conditions. It accelerates to maximum speed and continues to run at that speed with or without load. On account of quick and easy starting conditions the motor may profitably be shut down when waiting for steel from the bloomer.

On account of the accuracy with which the load may be calculated the motor capacity may readily be determined.

In the great majority of cases the motor is direct connected to the lay shaft, although the nature of the load is such that it probably represents the easiest gear drive of any kind of rolling mill load. However, since the speed of the lay shaft is usually around 82 as a minimum, direct connected motors are a perfectly practical design for either 25 or 60 cycle circuits, and are therefore to be preferred. A slip ring type induction motor is of course always used.

The power consumption in kilowatt hours per ton for mills of this type of course depends on the size of bloom and finished product, and on the tonnage rolled. Average figures on a combined 4-stand, 21-inch and 6-stand, 18-inch continuous mill show approximately 23 kilowatt hours per ton, including main roll and auxiliaries. Average figures on a 4-stand, 21-inch mill and 6-stand, 18-inch mill each driven by a separate motor show a total of approximately 22 kilowatt hours per ton, main motors only. Such figures as these are, however, of little value unless the size of bloom and finished product are specified.

Equipment for Rail Mills

Another common type is the 3-stand, combination rail and structural mill which is served by two tilting tables on the entering side of the mill. When rolling 85-pound rails, for example, five finishing passes are made, two in the first stand, two in the second and the final pass in the third stand. The right hand traveling table receives the bloom from the roughing mill and after passes 1 and 2 have been made in the first stand, transfers the steel to the second stand. As soon as the third pass has been finished this table moves back to its original position to receive the second bloom and at the same time the left hand table takes its position in front of the second stand to receive pass 4 and transfers the material to the third stand for pass 5. Assuming that a bloom is rolled every 48 seconds there would be overlapping of passes 1 and 4, and 2 and 5. It is evident that pass 1 cannot occur simultaneously with pass 2 or 3, but can with 4 or 5. In the same way pass 2 can occur with only 4 or 5 and pass 3 with pass 5. With the traveling tables working together properly and without delay in entering the steel overlapping would probably occur as shown in Fig. 3. The maximum load is 7500 horsepower and this peak load lasts for 3 seconds. Assuming, however, that a delay caused by difficulty in entering the steel for pass 4 occurs we might have overlapping of passes wherein the load conditions are less favorable, the maximum peak being 9500 horsepower caused by overlapping of passes 2 and 4, and this load lasts for 4 seconds. While this would not be a normal condition of rolling the motor and flywheel would have to be designed to take care of this condition.

The normal capacity of the motor should be calculated from the normal rolling schedule. The average load from the 42 second point to the 90 second point (this portion under normal conditions being continued by repetition) is 3200 horsepower, whereas the root mean square or heating capacity of the load is 4050 horsepower. Theoretically the stored energy in the flywheel should be such that the motor would carry only the average load, the flywheel giving up its energy when the rolling load exceeded the average and having energy stored in it by the motor when the rolling load was below the average. However, in actual practice this condition is rarely if ever attained. In the great majority of cases to completely equalize the load would require an excessively heavy flywheel, or too great a drop in speed. Furthermore, there is rarely, if ever, anything to be gained by preventing the motor carrying overloads within its torque and heating capacity. There have been cases where, on account of limitations in generating capacity, it has been found necessary to limit the imput to the motor to slightly above normal. Assuming that the flywheel was up to maximum speed at the 42 second point it is found that to prevent the load on the motor exceeding the average of 3200 horsepower the flywheel would have to deliver a maximum of approximately 27,900 horsepower seconds. To do this with a 15 per cent speed drop would require a wheel with a stored energy of approximately 100,000 horsepower seconds or 55,000,000 foot-pounds. At 90 revolutions per minute a wheel 22 feet in diameter, having this amount of energy would weigh approximately 490,000 pounds or 245 tons, which is of course ridiculous. As a matter of fact about all that any flywheel of normal de-

From a paper presented at a recent meeting of the Philadelphia session of the Iron and Steel Electrical Engineers. The author, J. D. Wright, is in the engineering department of the General Electric Co., Schenectady, N. Y.

Information Required to Calculate Size of Mill Motor

1. Size and Type of Mill
2. Mechanical Data:
   - *Description of mill:*
     - Reversing or nonreversing
     - Number and arrangement of stands (show sketch)
     - Working diameter of rolls
     - Revolutions per minute of roll
     - Is mill provided with flywheel? If so give weight, diameter, revolutions per minute and stored energy in foot pounds or horsepower seconds at maximum speed.
   - *Method of drive:*
     - How will motor be connected to mill:
     - Direct connected, geared, rope, belt, chain.
     - Type of coupling: solid, flexible.
3. Operating Data:
   - Maximum tonnage per hour and normal tonnage per 6 hours or per shift.
   - Number of shifts and total time operation per day
   - Initial weight and dimensions of steel
   - Final dimensions of steel
   - Character of steel (carbon content)
   - Number of passes
   - Section of steel after each pass
   - Method of handling steel between passes
   - Maximum number of passes filled at one time
   - Does steel come direct from another mill without reheating? If so give initial weight and dimensions, number of passes and time in first mill.
4. Motor Data:
   - *Alternating current or direct current:*
     - If alternating current, state voltage, frequency and number of phases.
     - If direct current, state voltage.
     - Is motor to be provided with flywheel? If so, give weight, diameter and stored energy in foot pounds or horsepower seconds at maximum speed.
     - Temperature guarantees.
   - *Speed requirements:*
     - Speed in revolutions per minute.
     - Constant, adjustable or variable
     - If adjustable speed how many intermediate speed points are desired between minimum and maximum?
     - How frequently will speed be adjusted?
     - How rapidly must a change in speed be effected?
     - If adjustable speed is required, does horsepower remain constant or vary with the speed? If so, how?
     - Frequency of starting and stopping.
     - Must control be arranged so that motor can be reversed in case of emergency?
     - Will jogging for the adjustment of the mill be required? If so, how frequently?
     - Should motor be provided with a thrust collar or breakable end thrust?

sign could do on such a load cycle would be to ease the load on and off the motor. The loads are of such duration that before the pass is through the motor would be carrying the entire load.

Probably the largest number of motor applications to rolling mills have been made to so-called merchant mills. A bulletin published by the United Engineering & Foundry Co. describes a merchant mill in the broad sense "as any mill which produces a general line of merchant bars, that is rounds, squares, flats and small shapes." A simple merchant mill consists of several stands of rolls arranged in a straight line. The material is fed to the mill by hand, the billet being roughed in the No. 1 stand next to the pinions and then passes successively through the remaining stands and finished in the last stand which is usually called the finisher. Under some conditions of rolling the bar is allowed to run out onto the floor and the last end entered into the next pass. Frequently, however, after the roughing passes have been made the material is looped from stand to stand so that the load on the motor is a combination of several passes. Overlapping of the roughing passes with the later passes may also occur if a sufficiently large crew is employed. A flywheel will usually be found necessary to help out on the short high peaks caused by the roughing passes.

Instead of this simple type of mill there is now in common use what is known as the Belgian mill which consists of a single roughing stand in combination with an ordinary guide mill. The use of this separate roughing stand gives increased tonnage by allowing the finishing rolls to be run at a higher speed than would be possible where the roughing and finishing stands must run at the same speed. The roughing mill is also usually of larger diameter than the finishing mill. It will be found that the use of a separate motor driven rougher frequently eliminates the necessity of a flywheel on the finishing stands. The length of bar produced may cause loads of such duration that a flywheel would be of no value in reducing the peak load on the motor. As in the case of the combination rail and structural mill previously discussed in order to calculate the load which the motor will be called upon to carry it is necessary to know the layout of the mill and method of rolling the material so that the loads due to overlapping passes may be determined.

Hand Fed Mill Eliminated

In order to still further increase the tonnage of merchant mills the hand fed roughing mill of the Belgian train has in many cases been eliminated. In a semicontinuous type of mill the billet is fed directly from the heating furnace into the first roughing stand. It is fed by hand only into stands 7, 8, 9 and 10.

The accompanying table shows the information required to calculate the proper size of motor required to roll a given product.

Buys Plant Control

Interests identified with the Grant Motor Car Corp., Cleveland, have acquired control of the H. J. Walker Co., that city, manufacturer of automobile engines. The purchase covered 60,000 of the 100,000 shares outstanding, according to a statement by Ben F. Hopkins, vice president of the Grant company. H. J. Walker, Norman Walker and W. C. Dunn, resign as officers and directors of the H. J. Walker Co., and are succeeded by D. A. Shaw, Ben S. Hopkins and George Salzman, as president, vice president and treasurer, respectively. Mr. Salzman also will serve as general manager of the H. J. Walker Co., of which F. W. Treadway is secretary. These officials with A. R. Fraser of the Guardian Savings & Trust Co., Cleveland, compose the board of directors. Plans are under consideration for refinancing the Walker company in order that production may be materially increased.

The McCrosky Tool Co., Meadville, Pa., manufacturer of machine tools, has leased space in the machinery exhibition and salesroom at the Bourse, Philadelphia. The exhibit is in charge of C. Harper Halfman.

Design of Furnaces and Ovens Is Factor in Cutting Costs in New Open-Hearth Plant

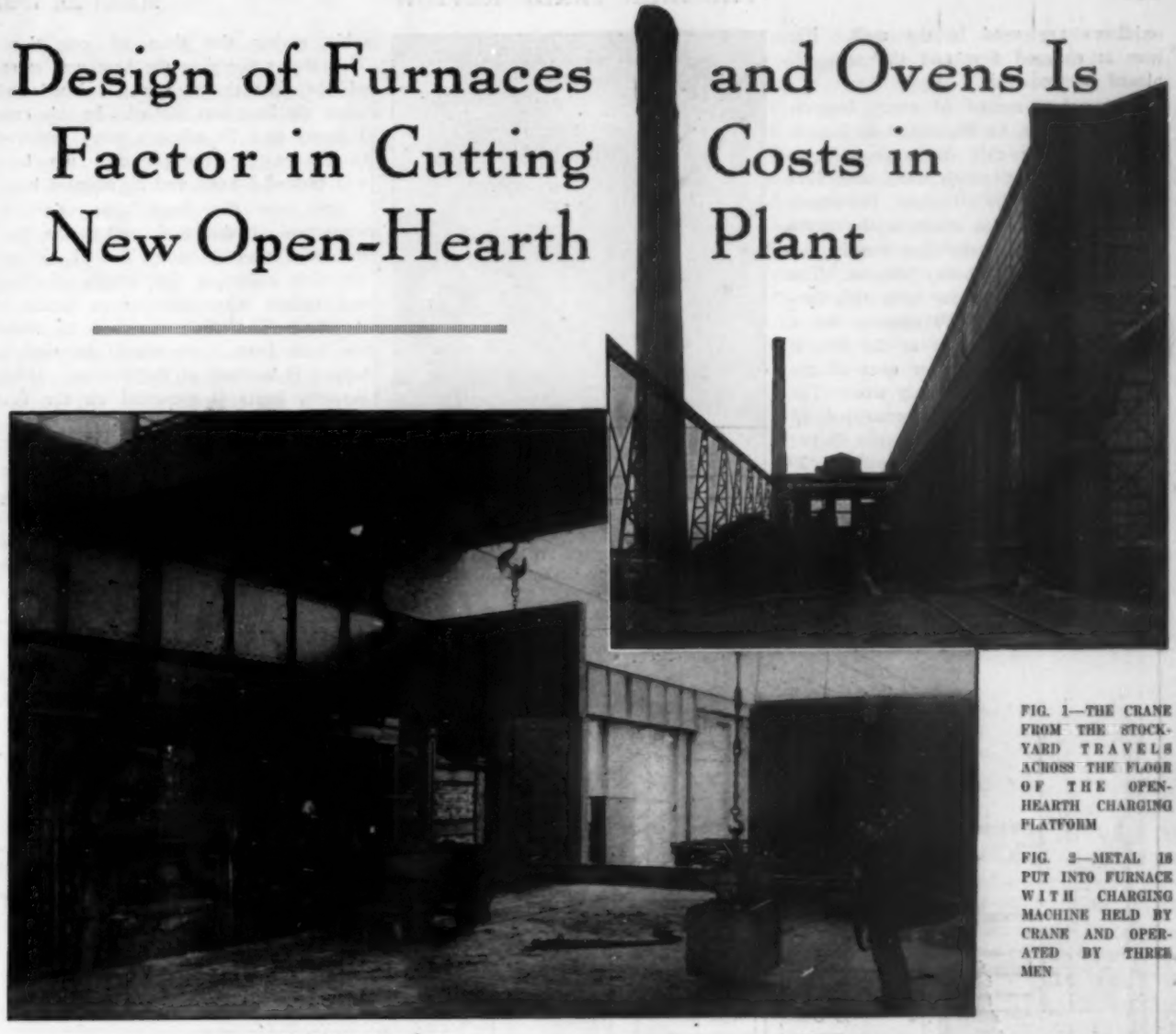


FIG. 1—THE CRANE FROM THE STOCKYARD TRAVELS ACROSS THE FLOOR OF THE OPEN-HEARTH CHARGING PLATFORM

FIG. 2—METAL IS PUT INTO FURNACE WITH CHARGING MACHINE HELD BY CRANE AND OPERATED BY THREE MEN

SOARING prices of raw materials and steadily advancing labor costs make it necessary for manufacturers to study more carefully than ever before ways and means for reducing operating expenses. Wages and material costs are beyond the control of plant executives at the present time and therefore it is only by trimming expense items that savings can be effected.

The extent to which economies can be introduced in an established plant depends largely upon the condition and arrangement of the equipment. Men who attempt to economize in a poorly designed and improperly equipped plant are working under a handicap, whereas those striving to cut costs in an establishment in which the equipment lends itself to variations in practice find their task much lighter. This latter condition holds true in the open-hearth steel foundry of the Vulcan Iron Works, Wilkes-Barre, Pa., designed by Westinghouse, Church, Kerr & Co., in accordance with the ideas of B. L. Weaver, foundry superintendent, and completed last year.

One of the principal factors contributing to economical operation in this foundry is the design of the open-hearth furnace, the drying and annealing ovens, and the auxiliary equipment. Steel is made in a 20-ton acid open-hearth furnace designed by the Wellman-Seaver-Morgan Co., Cleveland. This furnace is built on an elevated platform. The checker work which has been calculated to have 90 square feet of radiation surface per ton of metal is above ground. It is considered that this proportion of radiating surface in the regenerator to metal capacity gives the most efficient operating results.

The furnace doors are cooled with running water and are raised and lowered by compressed air which is controlled by valves centralized at one station near the wall in front of the furnace.

The charge is brought from the stockyard in charging boxes carried on flat-bottom cars. Each box holds 1300 pounds of pig iron or scrap and three boxes are carried by each car. The metal is loaded into the boxes by a magnet on a crane and the cars are carried to the charging platform by the same crane. The crane with its runway extending across the charging floor and along the stockyard is shown in Figs. 1 and 2. Fig. 1 also illustrates the method of unloading pig iron and scrap from the cars to the stock pile. The pits for storing the coal for the annealing furnaces may be seen under the railway car in the center foreground.

The charge is made up of 16 to 17 per cent pig iron and the remainder scrap. At present a large proportion of the scrap consists of steel shell blanks which contain under 0.04 per cent sulphur and phosphorus. As the steel takes up only a few thousandths of 1 per cent sulphur from the oil fuel, the sulphur and phosphorus in the finished steel are kept low. In addition to pig iron and scrap, iron ore for reducing the carbon in the bath, sand for making and thinning the slag and de-

oxidizers are used in the melt. Pig iron is charged first and the scrap is placed on top of it.

A complete record of every heat is kept on a form as illustrated in Fig. 6. The record in this illustration shows an average heat taken after the furnace has been idle all night. Frequently a second heat is made in the same day. In such cases the time required is approximately 1½ hours shorter. The best record made so far with this furnace is 4 hours and 10 minutes for a heat. From the column at the left it may be seen that 16.9 per cent of the charge was made up of pig iron. The remainder of the charge consisted of 79.9 per cent scrap; 1.8 per cent 14 per cent ferrosilicon; 0.9 per cent of 79 per cent ferromanganese; and 0.5 per cent iron ore. This column is signed by the foreman of the charging gang.

The history of the heat is given in the right-hand column. Above is a table giving the time of operations. This shows the time the heat was started, the time charging was finished and when the heat was melted. In this case 3 hours and 10 minutes were required to charge the furnace and the heat was melted 1 hour and 55 minutes later.

The time the final ladle additions were made is shown as well as the time the heat was tapped. Two lines are left for reporting the length of time and causes when there is a delay in tapping. The time required to make the heat from *commenced charging* to *tapped* is marked at the bottom. Delay between heats is recorded on the first line of this table.

In the middle of the right-hand column is a table giving miscellaneous information such as size of nozzle, condition of stopper after pouring, causes for any trouble which might have occurred in pouring, weight of skull, oilmeter readings, etc. This section is signed

FIG. 4—ARCHES FOR THE ANNEALING OVEN ARE DESIGNED SO THAT THEY MAY BE PILED ON TOP OF EACH OTHER

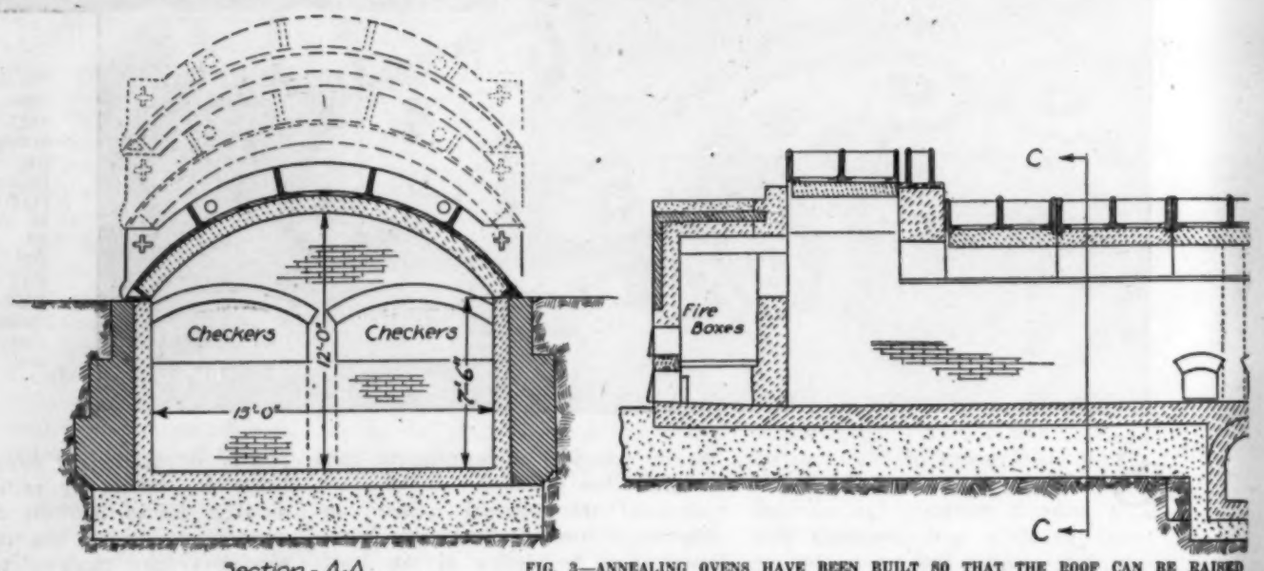
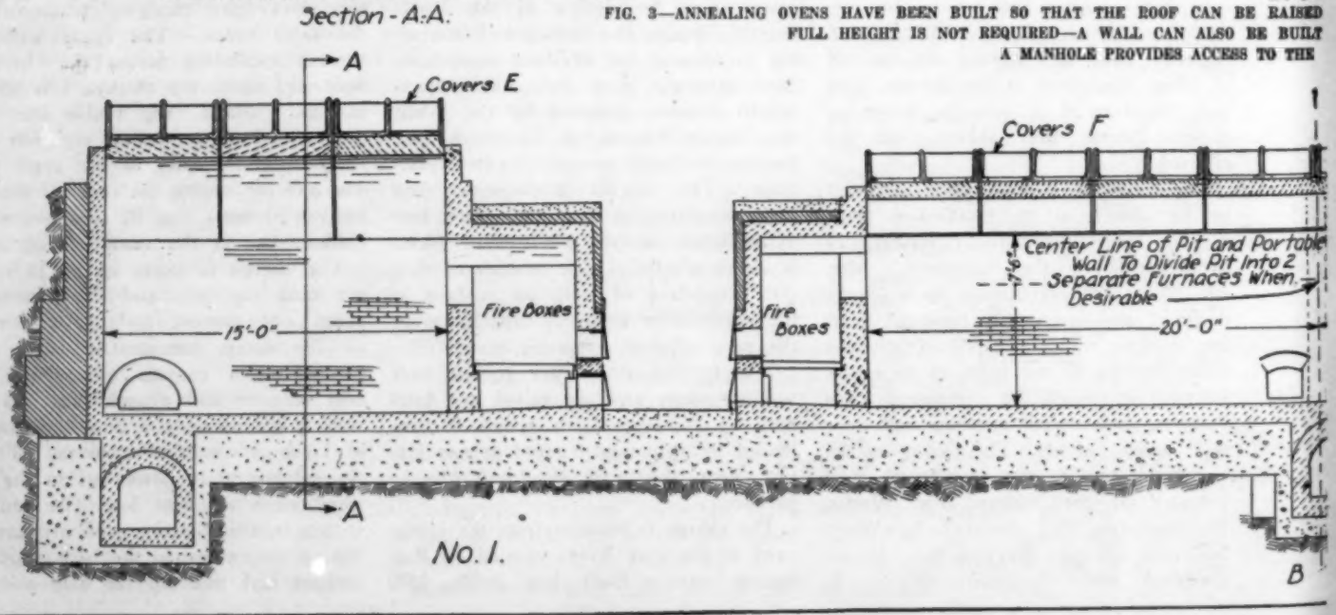


FIG. 3—ANNEALING OVENS HAVE BEEN BUILT SO THAT THE ROOF CAN BE RAISED FULL HEIGHT IS NOT REQUIRED—A WALL CAN ALSO BE BUILT A MANHOLE PROVIDES ACCESS TO THE



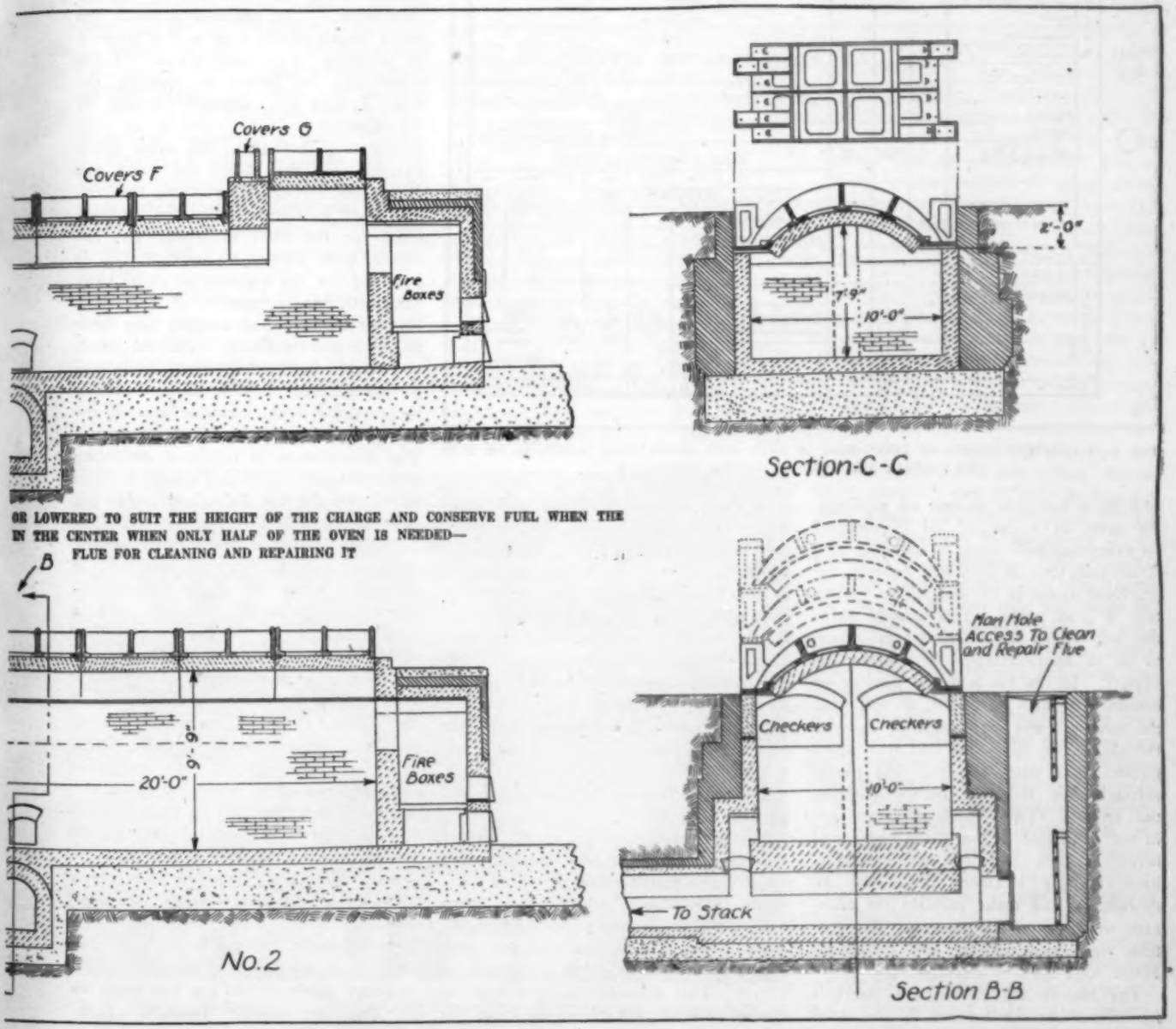
by the melter foreman. The table below is signed by the chemist. This table gives the composition desired and the composition obtained with the results of any preliminary tests which have been made. There also is a space in this table for recording the results of a physical test of the steel.

The metal is charged into the furnace by a machine built by Edgar E. Brosius, Pittsburgh. This is shown in Fig. 2. In the regular charging operation three men are used at the wheel. The machine is held by the crane with two steel chains. The heaviest weight is borne by the chain nearest the wheel. As may be noted, a bucket weighted with metal acts as a counter balance to the weight of the loaded charging box. The chain near the bucket raises and lowers that end of the machine for lifting the bucket off the car. After the bucket is raised the crane moves it into the furnace. The man at the

FIG. 5—VENTS LIKE THIS ONE ARE SPACED AT SHORT INTERVALS AROUND THE FOUNDRY AND SUPPLY FRESH HOT AIR

wheel then pulls the lever shown sticking horizontally from the bearing above the counter weight. This releases the shaft and allows the bucket to be turned by revolving the wheel. The lever directly in front of the wheel controls the plate on the end of the shaft, which engages the bucket. By changing the angle of slope of this plate the bucket is picked up or disengaged. When one box is emptied the crane moves the charging machine to the next box. After this box is engaged by the machine the crane moves back, carrying the car with it until it is in line with the furnace door for charging the engaged box.

The open-hearth furnace is fired with oil and all the oil is metered. It is interesting to note that not only is the oil metered as it goes into the main line but it is metered again at each place where it is used. Accurate metering is made possible by careful inspection of the oil before it is accepted



OR LOWERED TO SUIT THE HEIGHT OF THE CHARGE AND CONSERVE FUEL WHEN THE IN THE CENTER WHEN ONLY HALF OF THE OVEN IS NEEDED—
FLUE FOR CLEANING AND REPAIRING IT

VULCAN IRON WORKS—OPEN HEARTH FURNACE

DATE Oct. 28-19 REPORT HEAT NO. 47

CHARGE	MATERIAL	WEIGHT	$
	Pig Iron	7 050	169
	" "		
	" "		
	" "		
	Washed Metal		
	Open Hearth Scrap	6 730	
	Shell "	22 675	799
	Misc. "	3 090	
	Total	40 345	

ADDITIONS			
	Ferro Silicon 10%		
	" " ~~15~~ 14%	730	1.8
	" " 50%		
	" " 90%		
	Ferro Mang. 50%		
	" " 70%		
	" " ~~80~~ 79%	365	.9
	Silico Manganese		
	Spiegeleisen		
	Silico Spiegel		
	Aluminum—Ladle		
	" Pouring		
	Nickel		
	Manganese Ore		
	Cliff Shaft Ore		
	Ferro Chrome Ore		
	Anthracite Coal		
	Pig Iron		
	Vanadium		
	Iron Ore	200	.5
Total Charge			100%

FLUXES	
	Iron Ore
	Bottom Sand
	Lime

TIME OF OPERATIONS	HISTORY OF HEAT	Hours	Min.
	Last between heats	—	—
	Commenced charging	10	35
	Finished charging	1	45
	Time required to charge	3	10
	Melted	3	40
	Time required to melt	1	55
	Final additions made	4	35
	Delayed in tapping	—	—
	Cause of delay	—	—
	Tapped	4	40
	TIME REQUIRED TO MAKE HEAT FROM "COMMENCED CHARGING" TO "TAPPED"	6	05

Boil in ladle. (Yes or No)	No
Size of nozzle	2"
Condition of stopper after pouring	Good
If any trouble in pouring, give cause.	None
Weight of skull	None
Weight of spill, if any	None
Furnace working	Good
Number of heats for roof	47
" " " " " checkers	"
" " " " " port (north end)	"
" " " " " " (south end)	"
Reading of oil meter end of this heat	99880
" " " " " last heat	99040
Gallons of oil required for this heat	840
" " " per ton steel	40.4

Thos R Dix WELDER FOREMAN

CHEMICAL AND PHYSICAL ANALYSIS

	CAR.	MANG.	SIL.	SUL.	PHOS.	CU.
Specification desired	35/45	65/75	20/25	-04	-04	X
Comp. when melted						
1st preliminary test						
2nd " "						
3rd " "						
Added						
Final Composition	.37	.66	.25	.030	.038	

DESCRIPTION OF BAR	TENSILE	ELASTIC LIMIT	% ELONGATION	% CONTRACTION	FRACTURE

Charged by Jos. Oates

John H. Culp Jr. Chemist

FIG. 6—A COMPLETE RECORD OF EVERY HEAT IS KEPT—THIS SHOWS WHAT MATERIALS GO INTO THE FURNACE AND TIME OF VARIOUS OPERATIONS

and by a complete system of strainers. As soon as a car of oil is received an examination is made to see that it is clean and that it does not contain appreciable amounts of water. A gravity test is also made. This should show the oil, which is Pennsylvania crude, to be of approximately 30 degrees Be. gravity. If the oil is much heavier or contains a thick sediment it will clog the strainers and stop the flow through the line. The oil is put into two 60,000 gallon tanks when received. It passes through five strainers before entering the meters. Two 3-inch strainers are in the main line in the pump house and three 1¼-inch strainers on individual lines. These strainers clean the oil thoroughly and make possible the accurate working of the meters. The meters were supplied by the Pittsburgh Meter Co., East Pittsburgh, Pa.

The meters are checked at intervals by subtracting the amount in the tanks from the amount received and comparing this figure with the quantity the meters record. The tanks automatically indicate the height of the oil in them by a float on the outside of each tank which show the amount of oil in the tanks. The amount of oil used at the several stations is recorded on different reports and if too much is consumed, inquiry is made into the reason. This fact makes the operators use more care in conserving the oil and occasionally some change in the practice is found which reduces the amount of fuel oil required.

A study of the design of the drying and annealing ovens and the operation of the open-hearth furnace reveals additional innovations which have been originated to reduce operating costs.

The ovens are built so that one sidewall is common to both as shown in Fig. 8. This reduced the first cost of the ovens and also conserves heat, for when both ovens are used simultaneously, heat does not escape to the outside through this wall but goes from one compartment to the other. Each chamber is 17 feet 7½ inches wide by 50 feet long by 11 feet 10 inches high from the platform of the truck which forms the oven bottom. This gives a large space to heat, and in order to conserve heat when a full charge is not available for drying, arrangements have been made to use only half of the oven. The division is secured by the use of a kinnear rolling door in the middle, as illustrated in Fig. 8. When the door is left down on a sand seal between the two cars, the half of the oven which is not charged is cut off.

The drying ovens are heated with anthracite coal, pea size being used. A fan *C*, Fig. 8, with a capacity of 6550 cubic feet per minute furnishes the blast. The heat goes up through the port along the inside wall of each oven into a long narrow chamber, marked *heat* in the illustration. This chamber extends the entire length of the oven and is covered at intervals with steel plates. These plates may be moved to regulate the flow of heat into different portions of the chamber and thus maintain an even temperature throughout the oven. After passing over the molds the gases are drawn out through ducts along the outside walls by fans. Unlike the arrangement for the blast in which one fan serves both ovens, a separate fan is provided for the exhaust of each. The fans both have a capacity of 3000 cubic feet per minute. The exhaust fans serve to draw the moisture from the cores and molds out of the ovens and have proved efficient for this purpose. Heat is prevented from escaping around the bottom of the trucks by a sand seal. The temperature is regulated according to pyrometers. Cores are heated to from 400 to 450 degrees Fahr. and molds are dried at from 700 to 900 degrees. The difference in temperature for drying the molds is accounted for by the size of the molds to be dried, larger molds requiring a higher temperature and a greater length of time than the smaller molds. The majority of the molds can be dried in 7 to 10 hours.

In addition to the two ovens described, two drawer-type core ovens have been installed for the smaller cores. These ovens also are heated with anthracite coal and equipped with thermometers. All ovens are designed so that fuel oil may be burned in place of coal should this be found expedient at any time.

Two annealing furnaces have been provided by the company, the one considerably larger than the other. The larger furnace seldom is used but at times it is essential as occasionally castings are made which are too large to go into the smaller furnace. Both

ovens are so designed that the height of the roof may be changed to accommodate the size of the charge as shown in the layout of the pits in Fig. 3. This is accomplished by building up the side walls, on which the top covers rest, with brick. When the walls are low a special bung, *G*, Fig. 3, is used to connect a bung at the normal level at each end with the bungs at the depressed level. By this arrangement a reduction of 720 cubic feet is made in the furnace space to be heated. The change is not made frequently, as usually the lower arch is sufficiently high. The bungs are handled by a crane.

The furnaces are fired from both ends with soft coal. Like the drying ovens they are arranged so that either half of the heating chamber may be used alone. Thus either half may be fired and has a flue for the escape of gases. The covers are lifted off by crane and have been designed so that they may be piled on top of each other as shown in Fig. 4. The top covers also may be stored on top of each other on the furnace as illustrated in sections *A—A* and *B—B*, Fig. 3. This arrangement conserves a large amount of floor space which would be required were it necessary to place each bung upon the floor. A manhole, as shown in the elevation of section *B—B*, gives access to the flue for cleaning and repairing.

Castings are heated to 1650 degrees Fahr. for annealing. Care is taken to make certain that all castings in an anneal are heated through and the cooling is retarded. In case of some of the heavier castings nearly a week elapses from the time the castings are placed in the furnace until they are removed.

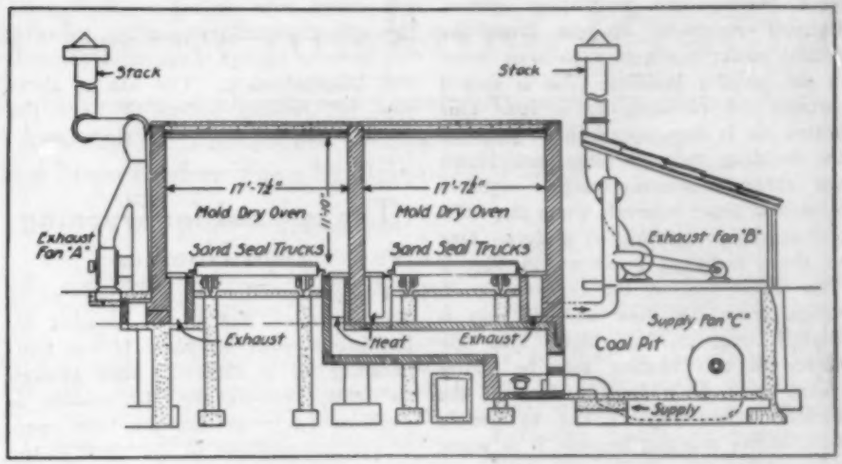


FIG. 8—ARRANGEMENT OF BLOWING AND EXHAUST FANS OF DOUBLE DRYING OVEN

The operation of the different furnaces is controlled according to a system of pyrometers. These were installed by the Brown Instrument Co., Philadelphia, which sends a man occasionally to calibrate them and maintain their accuracy. Indicating pyrometers are located at the annealing ovens and at the drying ovens for the use of furnacemen. These indicators at the ovens are supplemented by four recording pyrometers in the superintendent's office. Both an indicating and a recording instrument measure the temperature at one place in an oven. This affords an opportunity to check the accuracy of one with the other and such a check frequently is made. The recording instruments in the superintendent's office are shown in Fig. 7. Either of the two instruments at the left may be connected with any one of the thermocouples in the annealing ovens through the four-plug connection box underneath. However, only one couple can be connected with an instrument at one time. This is ample for present requirements, as there are never more than two operated simultaneously.

The two instruments to the right can be connected to couples in the drying ovens. Like the recorders for the annealing ovens, neither of these instruments can be connected with more than one thermocouple at the same time. More recording instruments will be added as needed and these can be connected with thermocouples through the eight-point switch which it is thought will provide for any growth in the near future. The foundry foremen have free access to the recorders in the superintendent's office and consult them frequently. The charts are kept for reference and are consulted in case any unusual condition arises during casting, or if there are any defects in the castings which may be attributed to improper drying of the molds or to the method of annealing. A customer may see from the charts of the annealing ovens just what heat treatment has been given his castings, and the foreman of the annealing room may assure himself that the furnace has been kept at the specified temperature during the anneal. Each chart records the temperature for 24 hours, but the chart may be left on more than 24 hours without the recording lines crossing each other if the furnace is coming up to temperature or cooling. The instruments are actuated by individual 8-day spring mechanisms, but they are wound twice a week to insure against irregularity in operation.

The Vulcan company lays stress on the advantage of keeping the workmen comfortable. One means for doing this is by maintaining a warm, well ventilated foundry. This is insured by a thor-

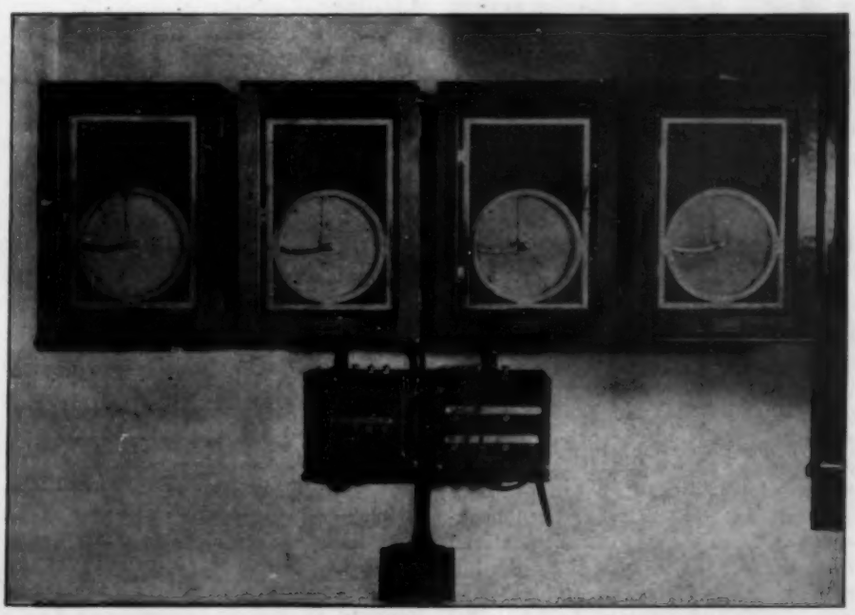


FIG. 7—PYROMETERS LOCATED IN THE SUPERINTENDENT'S OFFICE RECORD THE TEMPERATURES IN THE ANNEALING AND DRYING OVENS

ough heating and ventilating system. Exhaust steam is brought from the central power house to a radiator room in the foundry building. Air is sucked through the radiators by a fan. This heated air is then forced to all parts of the building through pipes and blown out through screen-protected registers located at short intervals along the walls and at the center line of girders. One of these radiators is shown in Fig. 5. The center line of the registers is 36 inches from the floor and the top is slightly over 5 feet high. The efficiency of this heating may be appreciated from the remark of one of the molders who said, "I like to get in here in the morning because it is warm as toast."

Rolled Zinc Output Shows Decline of 20 per cent

According to the geological survey the production of rolled zinc in the United States in 1919 declined over 20 per cent in quantity and 45 per cent in value as compared with that in 1918. The percentage of loss in quantity was greatest in boiler plates and heavy sheets, amounting to more than 60 per cent, but there was a loss of nearly 30 per cent in ordinary zinc sheets. The output of zinc strips, on the contrary, was slightly greater than in 1918. The losses were apparently due to the cessation of the demand for zinc for war uses.

Rolled zinc has always been quoted as so much a pound, with discounts and extras for different gages and special sizes and shapes. On Feb. 15, 1918, the base price of zinc sheets was fixed by the government at 15 cents and the price of rolled zinc plates at 14 cents, and these prices held until the end of the year. On Jan. 2, 1919, with the passing of the war industries board, sheet zinc was relieved of governmental price control and the base price dropped to 13 cents a pound. On Feb. 6 it dropped again to 11 cents and on March 19 to 10 cents. On July 23 the price was advanced to 10.5 cents, on Nov. 14 to 11 cents, and on Dec. 16 to 11.5 cents. The average quotation for the base price during the year was 11.1 cents, which may be compared to 10.5 cents, the average price calculated from sales.

The principal producers and rollers of zinc, working through the American Zinc institute, are endeavoring to find and establish new uses for rolled zinc and to extend the present uses. The substitution of sheet zinc for sheet copper and brass and for tin plate, wherever possible, is urged, and likewise the substitution of sheet zinc for galvanized iron or other sheet metal in roofing, guttering, spouting, garages, refrigerator linings, household utensils, and hospital ware. The use of sheet zinc for roofing seems to offer the most promising field for expansion.

Tar is Used for Opening Iron Notches

Frequently the iron notch of a blast furnace has to be opened by burning it with oxygen. If the temperature of a skull is high enough to ignite the oxygen, no trouble is experienced in getting the hole open. If the temperature of the skull is too low, which usually is the case, some other means must be employed for igniting the oxygen. A method, which has been found highly satisfactory, is to use tar balls. These are prepared by mixing aluminum powder and iron filings with molten tar. After the mixture has cooled somewhat it is rolled into balls about 2 inches diameter which in turn are covered with ordinary paper.

After the iron notch has been drilled as far as possible and the loose clay raked out, a tar ball is placed against the skull. The oxygen pipe is inserted in the hole in such a way that the tip is about 2 inches back of the ball of tar. Oxygen then is turned on slowly. It unites readily with the aluminum powder and bursts into a flame. This in turn sets the tar on fire, the function of the tar being to supply a continuous flame in order to keep the oxygen burning. The iron filings soon are melted by the action of the heat and are blown in the form of molten globules against the iron skull with the result that the latter soon becomes heated to the point where the oxygen takes hold. The more iron filings melted in the hole, the quicker the oxygen will attack the skull.

Find Asbestos in Arizona

According to the United States bureau of mines, an asbestos claim has recently been located in Apache county, Ariz. The deposit is said to be extensive, having been traced over 20 miles. Vein exposures are so prominent that, according to report, one can, without the aid of miners' tools, pick up a ton or more of crude asbestos that has been broken down from the exposures. Material from the deposit, examined by the bureau of mines, is of the typical Arizona type. It is strong, flexible, silky and occurs in cross-fiber veins with a fiber length of 1 to 1¼ inches, while fiber 2½ inches in length has been reported. The material submitted shows the effects of surface weathering, and asbestos of better quality could probably be obtained by development work.

The deposit occurs on an Indian reservation, and the present law does not permit the development of asbestos deposits on unallotted Indian lands. The office of Indian affairs, through the secretary of the interior, recommended that authority be granted to develop unallotted Indian lands for the purpose of mining asbestos, coal, oil and gas, as well as metalliferous minerals, but favorable action was not taken thereon by congress.

Consider Cheap Power for Australian State

Cheap power, developed by converting the brown coal of Morwell, Australia, into electricity, is being considered by the state government of Victoria. Experiments have revealed the existence of between 120,000,000 and 150,000,000 tons of coal within one square mile, which can be obtained by the open cut method. It is estimated that a continuous output of 100,000 horsepower for 150 years can be had from these supplies. This will involve an outlay of nearly $12,000,000 and the authority of parliament will have to be obtained before anything can be done. This, however, seems to be assured. The scheme is meeting with approval from the manufacturers of the state, who appear to be delighted with the prospect of cheap power, and it may radically affect the industrial growth of the state.

Survey Persian Railroad

A syndicate representing the Anglo-Persian Oil Co., Vickers, Armstrong-Whitworth, and Weetman Pearson has been granted an option by the Persian government for the survey of a railroad from the present railhead of the Mesopotamian lines at Kuretu, near Kasr-i-Shirin, to Teheran, via Kasvin, with a branch line from Kasvin to Enzeli.

This powerful British syndicate will begin the survey immediately. It is expected that the line will be a continuation of the present metre-gage railway from the Persian frontier to Bagdad, and that it will follow the road built by the royal engineers to Hamadan. From Hamadan the line of the existing road will probably be followed to Kasvin-Teheran and Kasvin-Enzeli.

Compares Cokemaking Practice

European Plants Indicate Beauty of Design and Careful Attention to Detail, but Unnecessary Amount of Equipment Is Employed — Average Coking Time Higher Than in American Plants

BY JOHN I. THOMPSON

IN DISCUSSING American and European by-product coke oven practice it is convenient to make comparisons on the basis of architecture and construction, mechanical equipment and plant layout, and coking time. In observing the characteristics of foreign installations, the writer was much impressed with the fine architecture and careful attention to detail in some of the new plants under construction and nearing completion. In fact, it seemed that in some cases an attempt at beauty in architecture had been allowed to play too great a part in determining the arrangement of the apparatus. The careful design of the piping and the smaller details was striking. Everything about the work indicated great care and attention to detail. I believe that we in this country have not paid sufficient attention to beauty in design and refinement in detail, and that considerable improvement can be made in this regard without appreciably affecting the cost of construction.

The construction work was beautifully finished. Except in special cases our industrial plants are built strong and rugged, but they have usually been rough in finish. A little more finish will reduce operating costs. It is pretty generally agreed that dirt breeds inefficiency. A hard, smooth, concrete floor, properly finished, can be swept clean; while a rough, porous one cannot. Oil and tar stains can be cleaned from tile, but they cannot be removed from concrete. These things can be carried too far, but I have not yet seen a by-product coke plant that was ideally designed and constructed in these respects.

Mechanical Equipment and Plant Layout

American practice in regard to mechanical equipment and plant layout is distinctly superior. Our equipment is more rugged and more reliable. The new plants which we visited in Europe, although better in every way than those built before the war, are not comparable with American practice of the past few years.

The multiplicity of units to handle a small tonnage is very noticeable. We visited a plant in France which carbonizes about 2400 tons of coal a day. It is composed of six batteries of ovens arranged, not with a common center line, as is the American custom, but each battery separate, with parallel center lines and individual coal bins. This necessitated a pusher machine for each battery—the gas collecting main being in the center of the battery—and extensive duplication of coal and coke handling equipment. When one considers that the shortest possible coking time in this plant was 24 hours and the normal time 30 hours, giving a pushing schedule of 35 to 45 minutes for each machine, it is evident that this arrangement is the cause of a great waste of equipment and labor. A modern American plant of this capacity would be equipped with one coal bin, instead of six; two combined pushers and levelers in operation, instead of six; and one coal charging car in operation, instead of 12. It would contain two batteries of about 60 ovens, instead of six of 42.

In England, we visited a plant similarly arranged constructed during the past few years by another builder. Of course, not all the plants were arranged in this way. We visited a new plant in Wales which was just ready to be put into operation. The details were carefully thought out, and the construction work beautifully executed. The nominal capacity is about 1200 tons of coal a day with a coking time of about 26 hours. For such a small capacity, we were impressed with the excessive amount of equipment provided. The plant is composed of 120 ovens, split up into four batteries of 30 ovens each, arranged in one line. With the larger ovens and the shorter coking time obtained in this country, such a capacity would be conservatively obtained with 70 ovens which would be constructed in one or perhaps two batteries.

There is one point which is true of the by-product coke oven plants in all the countries visited. The cost of these plants, assuming the same unit prices for labor and material, must be considerably higher per ton of coal carbonized than similar plants as designed in the United States. If for no other reason, the long coking time which reduces the capacity of European ovens, as compared with American ovens of the same volumetric capacity, must add greatly to the cost of construction.

Coal is handled with extreme care, particularly in some of the collieries in Belgium. The mining of bituminous coal in France and Belgium is very different from the mining operations with which Americans are familiar. The mines are very deep, many of them over 3000 feet below the surface. The coal is relatively very much more costly at the pit mouth, and, as a consequence, it is mined and handled much more carefully than in America. Practically all the coal is carefully screened and washed. The larger sizes are sold at higher prices for special purposes, and only the very fine material is used for coking. The slurry and fine coal are also made into briquets, which are used quite extensively for locomotive firing on the railroads. The ordinary guarantee for a coal washing plant is 2 per cent, ash with a loss of about 2 per cent of good coal in the washery refuse. The ash content before washing is in some cases as high as 15 per cent or more, which would make the coal useless for coking purposes without washing. The washing water is used over and over again, thereby avoiding the contamination of streams with waste water. Draining bins seemed to be the common method of drying the coal.

Have Progressed in Coal Washing

The coal washing plants in Europe impressed the writer very favorably They were clean to a remarkable extent. In fact, it seems that European engineers have progressed much further in the art of washing coal than in the art of coking it.

The United States has much to learn from Europe along the lines of conservation. As our rich gas coals and coking coals become scarce, and therefore more valuable; as our mining costs increase, due to the increased

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From a paper entitled "Post-war Conditions in Europe with Some Comparisons of American and European By-product Coke Oven Practice" appearing on pages 427 to 444 of the December, 1919, *Proceedings* of the Engineers Society of Western Pennsylvania. The author, John I. Thompson, is chief engineer, the Koppers Co., Pittsburgh.

cost of labor; as freight rates increase, making it unprofitable to ship fuel with high ash content; and as the consumer realizes the economies which may be effected by the use of a cleaner and more uniform fuel, we will be forced to adopt European methods of conserving coal.

Most of the coal is crushed in jaw or roll crushers and pulverized in disintegrators. These disintegrators work very well for small capacities. We did not see any hammer mills such as we use so extensively in this country. Where coal is mixed it does not seem to be so carefully mixed as is our practice. Belt conveyors are used for handling coal, but not so extensively as in American coke plants. Perhaps the developments of the apparatus used in this country for the handling of coal and coke is largely the result of the large capacities of most of our plants as compared with those of Europe. The largest plant we visited carbonized about 2400 tons of coal, while a plant of 1200 tons capacity is considered a fairly large one. It would be practically impossible to handle the tonnages to which we are accustomed, with the ovens and the apparatus in use in Europe. The general practice in Europe is to push the coke out of the oven, through a coke guide composed of perforated pipes, onto an inclined wharf extending the full length of the battery. From this wharf it is either forked by hand into cars, the forking operation taking the place of mechanical screening, or it is fed through gates, extending the full length of the wharf, to a steel pan conveyor which conveys it to a screening station. Quenching immediately in front of the oven was abandoned several years ago in the United States, but we did not see a plant in Europe with a central quenching station.

Disadvantages of Quenching at Ovens

It is not necessary to point out to American operators the disadvantages of this system. Quenching is a dirty operation, at best; and with the system in use in Europe it is not possible to provide for conveying the steam away from the ovens and the immediate vicinity, or to dispose properly of the waste water and its entrained coke dust. In cold weather this method of quenching is especially objectionable. A central station is much cleaner and gives greater uniformity in quenching. The continuous wharf of massive, arched concrete or brick construction, covered with cast iron plates and equipped with feeder gates the full length of the battery, is very expensive; and steel pan conveyors are not suitable for handling coke, due to the abrasive action of the coke on their many moving parts.

It seems to the writer that this choice of coke handling equipment is largely responsible for the extensive duplication in the equipment used. One of the plants previously referred to has a capacity of approximately 1800 tons of coke and is equipped with three steel pan conveyors, each conveyor located between and serving two batteries of ovens and delivering coke to individual screening stations. The first cost, maintenance, and labor cost of such appliances, must be excessive. For the same service we would employ a single wharf instead of six, and one conveyor and central screening station instead of three.

Some of the most modern plants abroad are equipped with a large coke screening and loading machine, which travels on rails in front of the ovens. The quenching is done directly in front of the oven, while the coke passes through the coke guide, by means of a water spray formed by forcing water through the perforated pipes of which the coke guide is constructed. The coke then falls on the inclined wharf which is full length of the battery, and a large percentage of the quenching is done by hand on this wharf. Gates are provided at the lower end of the wharf throughout the entire length to discharge the coke to a large steel bucket elevator which is mounted on the machine and which delivers the coke to a bar screen which terminates in a chute to the cars. The breeze and small coke pass through the screen into cars which are placed directly under the machine. Such a machine could not easily be supplied where several sizes of coke are to be produced. It is an improvement over the pan conveyors just described, because it makes it possible to handle the coke with machinery and construct several batteries in one line and thus economize in pushers, coal bins and charging cars. It does not, however, eliminate the objectionable feature of quenching in front of the ovens.

In Belgium coke handling apparatus has seldom been installed. When coke can be forked by hand from a wharf into cars for an equivalent of 4 cents a ton, which was the cost before the war, it is hardly to be expected that mechanical equipment will be installed to do the work. Such labor rates are a thing of the past and mechanical equipment will undoubtedly be required in the future.

There is no radical difference between the by-product apparatus of the several types in common use in Europe and similar types in this country. In this department of the work, as in the others, no effort seems to have been made in the newer plants to skimp the apparatus either in quantity or quality.

Coking Time is Excessive

In our visits to coke plants the question most often asked by managers and superintendents (second only to inquiry regarding our labor situation) had reference to the short coking time prevailing in America. In England, France and Belgium, designers and operators of by-product coke ovens cannot understand why the normal coking time of American ovens averages only about 60 per cent of the normal coking time for ovens of the same average width in Europe. We have found it very difficult to explain such a great difference to European engineers and operators as being due to improved methods of construction and operation; but this great difference can be accounted for in no other way. Briefly, the following are the most important explanations:

It is the practice in this country to use silica material in by-product coke oven construction. Some English firms were experimenting with silica walls in old batteries that were

Says American Practice is Superior

IN APRIL, May and June of 1919, John I. Thompson, chief engineer of the Koppers Co., Pittsburgh, visited England, France, Belgium, Norway and Sweden for the purpose of studying the progress being made in those countries in the by-product coke industry. In an introductory paragraph to the accompanying article, he summarizes his impressions as follows:

"It would be a much easier task if I could report some vital respects in which European practice, as I saw it, is superior to ours; and I am sure this paper would be much more acceptable to those engaged in the industry, if as a result of the trip, I could point out more ways of improving American methods. I have returned to America with the positive conviction that in the more vital things our construction and operation of by-product coke plants in this country is superior."

being repaired, but this will hardly be a fair test. I think there is not a single battery of ovens in England, France or Belgium constructed of silica brick. The material used ranges from what we would term fireclay up to quartzite, with a maximum silica content of about 85 per cent. The fusing temperature of silica brick is higher than the fusing temperature of brick such as they use; but more important still, the softening point under load is 500 or 600 degrees Fahr. higher for silica brick than for fireclay or quartzite brick. Temperatures as high as 2700 to 2750 degrees Fahr., which we maintain in the heating flues without injury to the brickwork, cannot be obtained with material of lower silica and higher alumina content. For this reason, there is much greater safety in operating a battery of ovens composed of silica material. The walls of the heating flues may be at the fluxing temperature before they will fail, but a clay brick wall will soften and deform under its own weight before its fluxing temperature is reached. Silica material also has greater conductivity, which, added to the much higher temperature head available, makes it possible to transmit the requisite heat through the walls and into the coal in a much shorter space of time. Silica brick expands to a greater extent than fire clay brick, but it has the convenient quality of continuous expansion at all temperatures up to its softening point. Fire clay brick, however, expands up to about 2000 degrees Fahr. and then contracts. It is practically impossible to keep coke oven construction gas-tight under such conditions. As expansion takes place, the tie rods and buckstays can be loosened, but tie rods and buckstays will not close the joints opened up by contracting brickwork.

Lack Uniformity in Operation

The next considerations, which is of equal if not greater importance, is uniformity of operation. Coking operations are much more uniform in this country. A good operator here will fix the coking time to meet the coke or gas requirements within the limits of the capacity of the plant and insist on absolute regularity of pushing. The men responsible for the heating must see that the coke is ready to be pushed at the scheduled time. Such regularity of operation is not obtained in Europe. Either the plants which we visited were not properly operated, or their design and construction are such that they could not be properly heated. The heats were generally not uniform.

Gas pressure regulation in the ovens does not receive the careful attention that we give this feature. We visited a new plant in which gas exhausters were to be driven by a motor through a line shaft with no means of regulation except by operating, by hand, a gate-valve in a by-pass line around the exhauster. Nowhere did we see any serious attempt to control the gas pressure in the oven chamber. With leaking walls and wide ranges of gas pressure within the ovens it is impossible to obtain good heating. It is not putting the case too strongly to say that we did not visit a plant in which the gas was properly burned and the ovens uniformly heated.

The reliability of the mechanical equipment is a matter of great importance in the maintenance of uniformity of operation. Some of the new plants in Europe show marked improvement in this respect.

Moisture is Not Chief Factor

It seems to be the opinion among Europeans that the great difference in speed of coking in American ovens is due to the nature of the coal or to its moisture content. I have inquired carefully into this matter and experts tell me that this is not true. We have a wider range of coal in this country than can be found in Europe, possessing all the characteristics that tend to lengthen the coking time, and in some cases to a more marked degree than in European coals. High moisture content has some effect on the coking time, but in 16 hours we have coked coal with 15 per cent moisture—so wet that the water ran out of the oven doors—in an oven with an average width of over 19 inches. A difference in the quality of the coal may affect the coking time, but cannot be charged with a difference of 10 to 14 hours. We did not visit a plant that was pushing coke in less than 30 hours and the maximum practical speed in the newest plants is 24 hours.

The only explanation for the greater speed of American ovens is to be found in the details of design, the materials used in the construction, and the more uniform and scientific operation.

Decide on Tunnel Plans

The New York and New Jersey tunnel commission has decided that the proposed vehicular tunnel between New York and New Jersey will have twin tubes with an external diameter of 25 feet and a 20-foot roadway. The commission rejected proposals made by Edward A. Byrne, one of its members, for a 3-line tunnel. Mr. Byrne claimed that the estimated capacity of the 2-line tunnel of 2200 vehicles an hour in both directions, would be reached in six years. He said that the 3-line tunnel would cost only about 14 per cent more to build and that it would give nearly 100 per cent greater capacity. The other four members of the commission are: William J. Wilgus, chairman; John A. Bensel, William H. Burr and J. Vipond Davies.

British Firm Is Planning More Extensions

Some information regarding prices and costs is furnished by Henry Bessemer & Co., of Sheffield, in their report for the past year just issued. They report a profit of £35,568 and, with the amount brought forward, there is a balance of £69,027. The directors wrote off for depreciation of plant and machinery £10,000, paid a dividend on the preference shares for the second half of the year at the rate of 5 per cent per annum, less tax of £2500, a final dividend of 7½ per cent on the ordinary shares, making 10 per cent on the latter shares for the year, and carried forward £41,527.

The directors explained that owing to strikes affecting both supplies and transportation of raw material and fuel, operations were intermittent. Owing to the vastly increased cost of manufacture additional working capital is necessary. Hematite pig iron which in 1914 was £3 12s 6d per ton is now £11 15s; coal, which was 13 shillings per ton, is now £1 11s 6d. Wages have increased 230 per cent and the company's turnover was over 100 per cent. To provide for further developments and extensions the directors propose to raise by the creation of 100,000 ordinary shares of £1 each an additional £100,000, bringing the total capital to £400,000.

In a report just issued by the industrial bureau of the board of trade of Baltimore, it is stated that in February, that city acquired 11 new industries. During that month, there were also announcements of seven expansions of existing plants. These developments, according to George C. Smith, head of the bureau, will open up new employment for about 1000 persons and will require a plant investment of approximately $1,180,000. The largest new industry specified is the Drop Forge & Mfg. Co., which acquired the John T. Lewis plant.

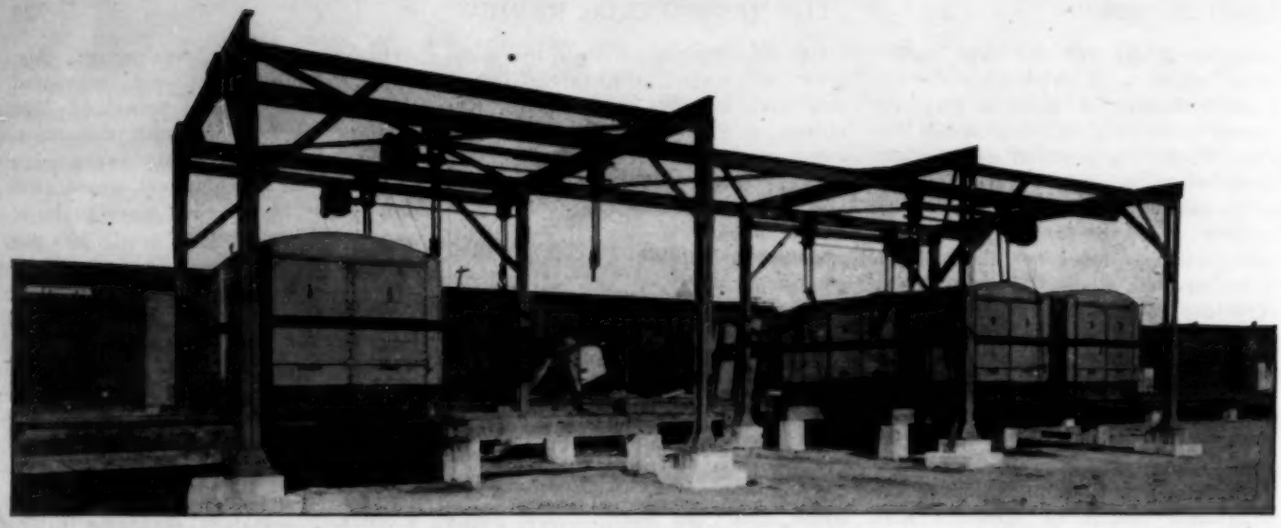

Fig. 1—General view of superstructure, hand hoists, demountable bodies and entrance for motor trucks at Norwood, Cincinnati, sub-station of the Baltimore & Ohio railway

Removable Truck Bodies Save Labor

BY B. F. FITCH

FOR years trucks have been proven valuable transportation mediums, but their adoption and scientific operation has been ignored by railroads whose business is primarily transportation. This was possibly due to the fear of competing service similar to the old theory a couple of decades ago that interurban lines would detract from railroad earnings.

Between all the widely distributed freight houses of the various railroads in each terminal, box cars are used in transfer or connecting line service. When so used, they are in various sections termed "trap," "transfer" or "ferry" cars. For instance, in any city with seven noncompetpeting railroads radiating to different sections, each line receives daily in its city cars some freight for each of the six connections. Numerically this means 42 cars in transit to and 42 cars in transit from, a total of 84 cars. But due to yard interchange delays these cars average a third day arrival instead of a second day arrival; hence, 252 cars are assigned to such service. Thus 75,000 cars days are required annually. Industrial expansion at any city with seven initial lines, has, as a rule, outgrown station facilities, and railroads for economy's sake have strategically established substations along their rights-of-way as traffic influences for shipments from outlying districts. Since all the freight from these outlying districts has to be brought to main stations to be consolidated in cars for despatch from such main stations to destination points, and since all of the freight for these substations comes out of main station cars on arrival, trap cars are necessary in this main substation service of each line.

The number of cars so used is a multiple of stations. If, as previously stated, each of the seven lines has three stations 42 cars are required, movement delays to which are as great as connecting line cars; therefore, the wasting of an additional 37,800 car days. This explains one of the reasons for shortage and an operating abuse which has been obsoleted by the success of a motor installation at Cincinnati. Briefly, this installation consists of overhead rails, electric cranes, electric hoists, motor trucks and a plurality of interchangeable motor truck bodies, as shown in Figs. 1, 2 and 3. The system of operation requires an empty body for each station movement de-

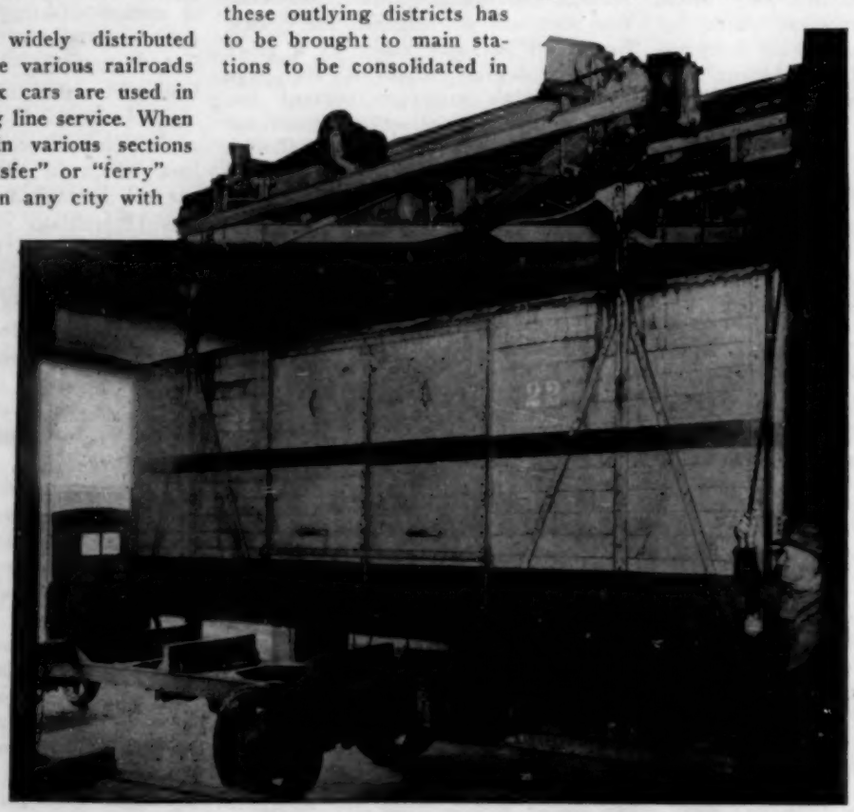

FIG. 2—REMOVING THE BODY FROM THE TRUCK AT EAST END STATION OF PENNSYLVANIA RAILROAD. NOTE THE ARRANGEMENT ON THE HOIST WHEREBY A SINGLE DRUM CARRIES THE CABLES FROM TWO CORNERS

The author, B. F. Fitch, is president, Motor Terminals Co., New York.

mand of railroad on its inbound main station platform. At the larger stations there are several locations for such body settings, thereby decreasing the trucking distance for freight. As the freight comes from the cars, it is trucked to the nearest location containing a body carded for any connection or any substation.

When loaded, these bodies are sealed and under telephone order of a joint dispatcher, employed by the railroads, mechanically loaded onto trucks and thus routed over city's streets to connection.

main station, where it is consolidated with other city freight in line cars made up daily to innumerable other destination points.

From the foregoing it is evident that all freight, except possibly the portion arriving during the last hour of station operating day, whether between main and substations or between main stations of the various railroads, is currently loaded and out of the terminal. Previously this freight by trap cars suffered an average three-day delay and the shuttle movement of these individual cars over terminal rails interfered

economy, $61,652.96; increase inbound platform floor area, 14.8 per cent; release 66,862.5 cars for line service, per annum; extend present labor, 30.4 per cent, and eliminate the rehandling of 86,976 tons of freight, lessening railroads liability of loss and damage.

In 1919 equipment orders were entered and railroads commenced station changes and superstructure construction. The terminal is not fully equipped, for both the railroads and the Cincinnati Motor Terminals Co. which is operating this equipment on contract basis for the railroads, have suffered exasperating de-

Has System Wider Application?

IN THE accompanying article which is abstracted from a paper read at the recent convention of the Material Handling Machinery Manufacturers' association, New York, the author briefly outlines the system of interchangeable truck bodies, trucks and hoists used by the railroads entering Cincinnati to convey freight between the various sub-stations. Although this development primarily is of interest to railroad officials, we believe that the methods employed at Cincinnati may suggest ways and means for manufacturers to improve transportation service between separated plant units. It would appear that in large establishments with various units scattered over a wide area, the shipping problem has some points of similarity with that confronted by the railroads in the Ohio city.

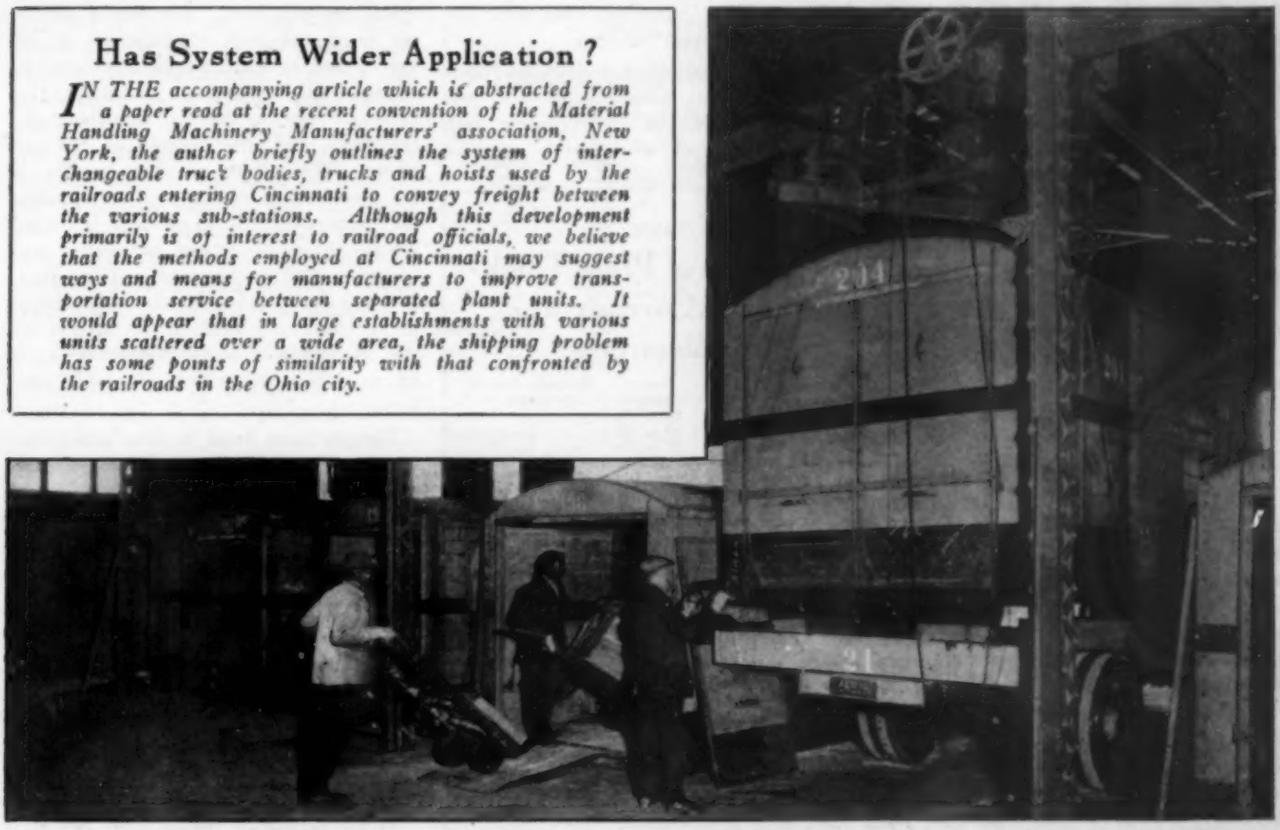

Fig. 3—AFTER A BODY HAS BEEN LOADED, IT IS LIFTED BY A SPECIAL ELECTRIC HOIST AND LOWERED ONTO A TRUCK CHASSIS. THE HOIST IS CONTROLLED BY ONE MAN, AS SHOWN

On arrival at outbound platform of the connecting line, the body is mechanically removed and an empty body, previously unloaded, is similarly put onto motor truck chassis for delivery to inbound platform of that house, where the operation is repeated and another loaded body forwarded in the same manner to some other freight house.

If the load happens to be carded to a substation, it remains on platform until dispatcher is advised by agent at substation that return load is available. Then the loaded body of inbound freight to that substation is forwarded and the motor truck exchanges same for the previously reported load of outbound freight to be delivered at

with the group movement of complete cuts of station cars, causing the congestion which previously made Cincinnati notorious as a check-valve in rail routings.

In May, 1917 the Big Four railroad permitted a test installation between its five main and substations. The innovation was an early success, but the other roads were skeptical of its enduring efficiency. In the early months of 1918 a special committee was appointed to analyze the entire terminal and, based upon Big Four accomplishments, recommend what economics and benefits could be anticipated from completely motorizing Cincinnati's terminal.

The summary of this comparative report prophesied the following: Annual

lays. However, in recent analysis of accomplishments it is proved that, due to increased operating costs of railroads the prophesied 17.1 cents per ton economy is in practice actually a saving of 35.2 cents per ton and, therefore, the annual economies will be $126,507.75 instead of $61,652.46.

What has been done at Cincinnati can be adapted to the varying demands of all principal terminal cities. The flexible possibilities of trucks are now clearly defined for industries whose transportation facilities are dependent upon rail extensions. Opportunities at each point are limited only to intelligent installations following detail analysis to establish the greatest terminal deficiencies of carrier to meet demands.

Welding by Electric Arc Process

Principles of Arc Welding With Carbon, Graphite or Plain or Covered Metal Electrodes —Thickness of Plate to be Welded Has Definite Relation to Current and Diameter of Electrode

BY JOHN A. RANDOLPH

PROGRESS in the evolution of the electric arc can be said to date from the year 1800 when the primary battery was placed on a practical basis. It was from that beginning that the simpler phenomena of electric currents gradually came to notice. One of these, destined to unlimited service to the world was the formation of an arc by breaking a live circuit.

Owing to limited facilities for the production of current, it was not until after the dynamo electric generator was brought forth in 1867 that the electric arc was applied to commercial use. In this article the arc will be considered in its relation to producing heat for welding purposes.

There are two general classes into which electric welding can be divided, namely the autogenous and the forge methods.

Scope of Two Methods

In the autogenous process, the metals are heated to such a temperature that they will readily flow together into a weld, without force or pressure. It is in this class that the arc weld belongs. In the forge process, the metals are so heated that they can be forged together by hammering or the application of pressure. The chief methods in use by the forge process are the spot and butt incandescent welds.

The arc method of electric welding is in more general use by far than any other welding process making use of electricity. The heat producing nature of the electric arc is well known. Its flame is the hottest known to science, being estimated at a temperature of from 3500 to 4000 degrees Cent. Both direct and alternating current can be used for arc welding, but at the present stage of the art, direct current is the more generally employed. Alternating current, however, presents interesting possibilities which have not as yet been fully developed.

Either carbon, graphite, or metal electrodes can be employed. In the Bernardos process, which has been in use for more than 30 years, the filler metal is fed into the weld by hand from a metallic rod or bar. The movable electrode is made of a carbon pencil from 6 to 12 inches in length and from ¼ to 1½ inches in diameter, depending upon the character of the work. The metal to be welded is made the positive terminal of the electric circuit and the movable electrode the negative, for two reasons.

First, the heat developed at the positive terminal is generally 75 per cent hotter than that at the negative and, by connecting the work to the positive side of the circuit, this intense heat is applied exactly where desired. Second, minute particles are thrown off from the positive terminal and carried to the negative. If the carbon were to be connected to the positive side, particles of carbon would be carried into the weld, which would prove detrimental to obtaining a union of maximum strength.

Table I

Relation of Plate Thickness, Current and Electrode

Plate thickness Inches	Current Amperes	Electrode diameter Inches
1/16	20 to 50	1/16
1/8	50 to 85	3/32
3/16	75 to 110	1/8
1/4	90 to 125	1/8
5/16	110 to 150	5/32
3/8	125 to 170	3/16
7/16	140 to 185	3/16
1/2	150 to 200	1/4
9/16	165 to 215	1/4
5/8	175 to 225	1/4

In the metal electrode process the work is made the positive terminal and the movable electrode the negative as in the case of the carbon electrode, but the movable electrode is made of metal and is designed to melt under the heat of the arc and to serve as the filler metal. It is known as the Slavianoff process.

The molten metal from the electrode is carried automatically, directly to the weld and the process is therefore particularly well adapted to vertical and overhead work.

The arc is formed by first touching the metallic electrode to the work and then withdrawing it. It consists of a highly luminous central core of iron vapor surrounded by a flame composed largely of oxide vapors. The intense heat causes chemical reactions instantaneously to occur between the vaporized metals and the atmospheric gases. This causes a flame of incandescent gaseous compounds completely to envelop the arc core. But drafts resulting from the high temperature of the vapors and by local air currents tend to remove this enveloping screen as fast as it is formed, thereby disturbing the continuity and effectiveness of the arc stream. To secure the best results, it is therefore necessary to manipulate the electrode until a position is found where these disturbing influences will be properly compensated. This position can be obtained by the maintenance of a short arc and an inclination of the electrode toward the work such as to offset the effect of draft currents.

The surfaces must be absolutely free from oxides and dirt, inasmuch as the presence of foreign matter will prove detrimental to the weld.

With the proper length of arc, the voltage across the arc will never greatly exceed 22 volts for bare electrodes and 35 volts for those of the coated type. It will vary somewhat, owing to the impossibility of an operator's holding the electrode at an absolutely uniform distance from the weld throughout the time required for the work.

Using Coated Electrodes

The coated electrode is made of metal but has a coating of some kind applied to its surface for the purpose of excluding, as far as possible, the atmosphere from the molten metal both while it is passing through the arc and after it has been deposited.

Such a coating is needed not only for the special steels but also for the more common mild steel electrodes. The reason for this is to improve the metal in welds made with the grade of welding wire now in general use, and to make possible the use of a better grade of wire for some of the more important operations.

This method makes possible the use of electrodes of special alloy steel such as those varieties containing in combination respectively, manganese, carbon, nickel, vanadium and tungsten. Bronze and copper can also be used in welding

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through the medium of this type of electrode.

Metallic electrodes have proved unusually satisfactory chiefly because the combination of filler metal and electrode into one piece greatly simplifies the operation and at the same time enables the filler metal to be deposited in the weld with greater accuracy and effectiveness, making possible a more perfect union.

The size of electrode to be selected is dependent upon the type of joint to be made, the thickness and bulk of the work, and the current used. For instance, in the case of a lap joint, practically twice the amount of current and therefore a larger electrode will be required than in the case of a butt weld. This is for the reason that the lap joint has a much greater capacity for heat storage and dissipation. In the case of two ½-inch plates welded in the lap fashion, the heat involved is practically equivalent to that of a butt weld of two 1-inch plates. Table I shows the approximate values of current and electrode diameters for welds using plates of varying thicknesses.

Manipulation of the Arc

To secure the best results, the arc should be kept as short as possible. If a long arc is used, there is an increased tendency to the shifting of the arc stream by air currents, resulting in a thin deposit of the new metal with poor fusion, and a burning and consequent porosity of the fused metal. With the short arc, it is possible to create a more stable enveloping screen of inert gases, thereby protecting the fused metal from detrimental reaction caused by outside influences. For a current value of 175 amperes the arc gap should be about ⅛ inch.

Cutting by Electric Arc

Another use for which the electric arc is empolyed is cutting. For this purpose, the carbon electrode process is employed. The amount of current required depends upon the thickness of metal and the speed desired. It usually varies between 350 and 800 amperes. Table II shows the values of current, and speed and kilowatt hours per foot for cutting steel plate by this method.

Table II

Speeds of Cutting by Electric Arc

Thickness Inches	Current Amps.	Speed Minutes per ft.	Kw-Hrs. Per ft.
¾	400	.50	.312
½	400	1.20	.75
⅝	400	2.14	1.34
¾	400	3.00	1.88
1	600	3.75	3.50
1⅛	600	4.32	4.10
2	600	6.75	6.30
4	600	16.90	15.50
6	800	20.00	36.20
8	800	40.50	50.00
10	800	59.00	74.00
12	800	65.00	82.00

The standard voltages on circuits used for light and power are generally 110 or 220 volts, a value much higher than that required for welding which is usually not over 50 volts. If the welding circuit is connected directly to a power supply of standard voltage it is necessary to reduce the pressure by means of a resistance placed in series with the welding circuit. This causes a considerable loss of power through heating, in the resistance. To obviate this difficulty, an indirect method employing a motor generator set is used, the motor being connected to the supply circuit and the generator to the weld. The generator is designed to furnish directly the range of voltages required by the arc, the pressure being varied by regulating the field excitation of the generator. There is thus no material loss of power between the supply source and the weld.

Either Source of Supply Satisfactory

Another advantage in using the motor generator is that either a direct or alternating-current source of supply can be used, by simply providing an alternating or direct-current motor as required. Any number of welding circuits can be fed at the same time by the use of a switchboard, bus bars and a distribution system controlled by switches, enabling the various operators to work independently of one another. Motor generator sets may be either portable or stationary as desired.

Begin Work on British Strip and Bar Mills

Since the Templeborough works of Steel, Peech & Tozer, Sheffield, were placed in operation recently announcement has been made of the

Machinery Exports Gain Slightly Over December

PRACTICALLY the same amount of machinery was exported from the United States in January, 1920, as in the preceding month, according to figures just issued by the bureau of foreign and domestic commerce. The total value of machinery shipments abroad in January was $3,453,946 as against $3,405,680 in December, last year. This represents a gain of but $58,266 and reflects the continuance of the adverse exchange conditions. First place was taken by England with $742,308 in January from France, which held it in December, France drops to second position with $718,127. Canada continues in third place with $612,438, while fourth place again is occupied by Japan, with $344,746. Japan ranked ninth in December. Belgium and Cuba stand fifth and sixth, with $149,913 and $101,195, respectively. An interesting item in the report is the shipment of $60,100 worth of machinery to Germany in January. Detailed figures follow:

	Lathes		Other machine tools		Sharpening and grinding machinery		All other metalworking machinery		Total	
	Jan. 1920	Dec. 1919	Jan. 1920	Dec. 1919	Jan. 1920	Dec. 1919	Jan. 1920	Dec. 1919	Jan. 1920	Dec. 1919
France	$101,691	$136,419	$151,456	$191,095	$ 79,809	$ 63,908	$ 385,171	$ 572,351	$ 718,127	$ 963,773
England	137,507	171,708	174,093	212,996	124,291	62,277	306,417	375,269	742,308	822,250
Italy	9,637	2,032	16,605	29,703	.....	13,385	36,641	53,445	62,883	98,565
Belgium	34,275	12,720	20,299	14,449	29,081	540	66,258	49,012	149,913	76,721
Japan	45,461	8,098	41,646	14,054	31,787	7,523	225,852	31,884	344,746	61,559
South America	33,533	23,765	32,065	36,490	2,616	4,877	12,227	91,248	80,441	156,380
Canada	126,202	68,317	220,564	196,883	66,693	39,456	198,979	235,782	612,438	540,418
China	11,993	.....	26,193	1,187	1,764	45	18,795	989	58,745	2,221
Netherlands	17	4,340	1,459	7,472	1,223	286	8,013	4,121	10,712	16,219
Norway	3,524	2,672	7,337	5,433	6,209	2,068	16,937	8,577	34,007	18,750
Sweden	18,551	15	17,343	137	9,422	233	51,313	.....	96,629	385
Denmark	4,098	1,019	4,570	.....	2,250	4,489	4,733	2,330	15,651	7,838
Spain	22,104	30,389	10,319	22,322	5,158	7,176	25,857	50,576	63,438	110,463
Cuba	9,250	14,594	54,431	16,090	7,709	897	29,805	20,871	101,195	52,461
British India	21,697	5,891	133	12,623	254	13,476	7,086	133,203	29,170	164,193
Total	$579,540	$481,979	$778,513	$760,943	$368,266	$219,636	$1,394,084	$1,629,638	$3,120,403	$3,092,196
All other countries	51,731	125,753	38,260	76,274	26,108	25,227	217,444	86,230	333,543	313,484
Grand total	$631,271	$607,732	$816,773	$837,217	$394,374	$244,863	$1,611,528	$1,715,868	$3,453,946	$3,405,680

registration of a new Sheffield concern, the United Strip & Bars Mills, Ltd., with a capital of £2,000,000, to meet some of the requirements of Steel, Peech & Tozer. The latter company's wire rod mills have been in successful operation for some time, and a start has now been made in laying down the steel strip and merchant bar mills, arrangements for which were completed six months ago.

The billet mill, described in the April 3, 1919, issue of THE IRON TRADE REVIEW, has just commenced running, and is generally admitted to be the finest plant of its kind on the British side of the Atlantic. The 36-inch cogging mill rolls 3-ton ingots into 6-inch square blooms, the cogging down being completed in 11 passes, production being at the rate of 100 tons per hour. The billets feed the rod mill, while blooms required for slabs are handled by slab shears and passed on to the slab mill which consists of two stands of 21-inch rolls. The output of the mill eventually will be 10,000 tons a week. It is not expected that the steel strip mills will be in full operation until next year. The billet mill is starting at a most opportune time, in view of the great famine in steel in Great Britain, the firm being overwhelmed with inquiries for billets.

A good market, it is thought, could be developed in the Tientsin consular district, China, for gas producers using bituminous coal, as this fuel is mined in considerable quantities in the region, and can be obtained at moderate prices near the mines. The difficulties of transportation, however, result in an increase in prices for coal at points at any distance. There is no lignite, wood, or wood refuse in this territory available for fuel purposes.

Making Railway Castings in Manchuria

BY CHARLES C. LEE

AMONG the points of interest in the Far East visited by members of the Russian Railway Service Corps of the American expeditionary forces which sailed from San Francisco, Nov. 19, 1917, was Harbin, Manchuria. The headquarters of the Chinese Eastern railway is situated in this city, where important repair shops are maintained. Included in the shops is a foundry department which, although inefficient according to western hemisphere standards, is of considerable interest to foundrymen.

The foundry building is solid brick, the walls being 30 inches thick at the bottom and ornamented on the outside by an elaborate system of pilasters and copings. The only windows in the building are in the ends and as a result the interior of the building is quite dark. A little additional light is furnished through a few poorly constructed skylights in the roof. The main bay of the shop is equipped with two 10-ton electric traveling cranes and several side wall jib cranes. The latter are never used.

Any casting over a few hundred pounds in weight in this foundry is made in a flask and dried in the oven. All the remainder of the work, no matter how small, is bedded in the floor. The only exceptions to this rule are the oil boxes or journal boxes. These are made in flasks on a machine. The oil boxes in use on the Russian railroads differ materially from those on American roads. They are cast in halves, the joints planed in the machine shop and the two halves afterward bolted together. The only function of the molding machine in making the boxes is to roll the drags over. The inside of the box is made with a dry sand core and the cope is perfectly flat.

No system is observed in making cores as each man makes his own cores in close proximity to his job. Small stock cores are made by boys in any convenient place. The cores are made from a natural loam which does not require any binder. A certain amount of manure is mixed with the loam to give it porosity. The cylindrical cores all are swept on barrels wound with hay rope. All the cores are dried in the same ovens as the molds. The ovens are poorly designed and constructed and as a result are slow dryers.

Cupolas Have Forehearths

Two cupolas are provided for melting the metal, one of three tons, and one of five tons capacity. The metal does not accumulate in the furnace but runs into a receiver as fast as melted. This receiver or forehearth is attached to the front of the cupola, the bottom resting on the floor. It is provided with a slag hole near the top on one side which serves to warn the melter when it is time to tap the metal. The hole also serves to remove most of the slag. The receiver is enclosed but there is a section in front which is detachable and can be removed to fix the bottom every day. After the bottom is made ready and a quantity of wood placed to dry the inside of the vessel, the doorway is daubed with clay and the door clamped tightly in place. The fire which dries the inside of the chamber also dries the mud at the door joint sufficiently hard to prevent the metal from leaking through. A vent pipe, for which there is no obvious reason, is connected to the top of the receiver and is attached higher up to the shell of the furnace. An excellent grade of

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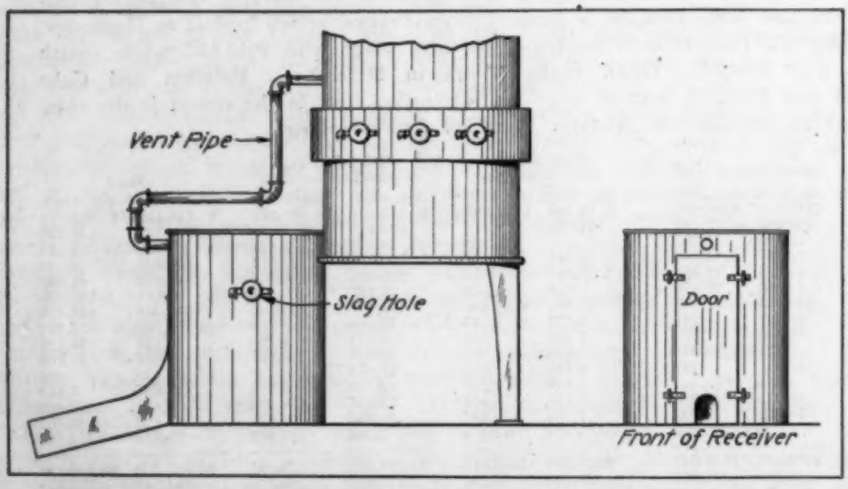


EACH CUPOLA IS PROVIDED WITH A RECEIVER ATTACHED TO THE FRONT, INTO WHICH THE IRON TRICKLES AS IT MELTS—AT THE RIGHT IS A FRONT VIEW OF THE RECEIVER

iron and coke are available, both being imported from European Russia. The iron is high in silicon and phosphorus and it is possible to pour large castings although the metal is melted neither hot nor fast.

A general idea of the operation of the shop may be gained from a study of the following items taken from a typical monthly report of men employed:

IRON FOUNDRY		
Molders	103	
Helpers	29	
Apprentices	23	
Chippers	36	
Cupola men	18	
Brass furnace men	18	
Carpenters	6	
Painters	1	
General labor	43	
		277
BABBITT SHOP		
Mechanics	7	
Helpers	2	
Labor	5	
		14
PATTERN SHOP		
Patternmakers	25	
Helpers	1	
Apprentices	3	
Labor	5	
		34
Total foundry force		325

In addition to the force of 325 men there was one general foreman; one foreman in the iron foundry; one in the brass foundry and one in the pattern shop. The office force included three men and one girl. Most of the workmen were Chinese with a few Russians. Compare the number of men with the output for the month in Russian poods. The pood is 40 Russian pounds or 36 pounds avoirdupois. The total output for the month of April, 1918, is shown in the following table:

TOTAL OUTPUT FOR THE MONTH OF APRIL TWENTY-THREE WORKING DAYS

	Poods	Tons
Iron castings	8085	145.00
Brass castings	369	6.64
Babbitt liners	1333	23.99

Analyzing this table we find that the total output of iron, brass and babbitt amounted to 175.63 tons for the month. There were 23 working days in the month and this gives an average of 7.64 tons a day or approximately 10 per cent of what a similar American shop would turn out in the same time.

There is another railroad shop at Nicolsk-Ussurvsk, but it is much smaller than the one at Hardin only employing 45 men altogether, all Russians. In August, 1919, this shop turned out 52,740 pounds of iron castings and 4585 pounds of brass, an average of 2397 pounds of iron and 208 pounds of brass a day.

Iron is cheap and the amount of return scrap is so large that no attempt is made to economize. The dump is full of iron which has been wheeled out with the refuse.

When furniture spring and other high carbon wires are being drawn to gage, pulverized soap is used as the lubricant.

Obtain Alcohol From Coal by New Method

A new method for the extraction of coke oven gas and its conversion into alcohol is in operation in certain iron and steel works of Great Britain, according to the American chamber of commerce, in London. Research work, it is stated, shows a yield of 1.8 gallons of alcohol to a ton of coal carbonized. Assuming that method be applied with success to, say, 14,600,000 tons of coal, carbonized in by-products ovens in Britain, a total yield of about 23,000,000 gallons of alcohol would result. In addition, there would also be 27,000,000 gallons from the gas works of the country, and as the annual yield of benzol from

VISE FOR REPAIRING PNEUMATIC TOOLS

these sources is respectively 34,000,000 and 30,000 gallons, a total supply of 114,000,000 gallons of benzol and alcohol would thus become possible against the present estimated demand for motor springs of 160,000,000.

It is asserted that experiments thus far indicate that the ethylene could be removed from gas by charcoal or sulphuric acid. The novelty of the process is said to lie not in the choice of the absorbent but in the manipulation to effect economy in these operations. By that process, it is claimed that cheap alcohol can be made from coal, and the loss in caloric value of the gas, through the abstraction of ethylene can be made up easily by other constituents.

Publish Monthly Electric Furnace Journal

The Electric Furnace is the title of an attractive monthly journal devoted to the electric furnace industry published by the Electric Furnace Co., Alliance, O. The first numbers of this magazine dated January and February contain articles relating to the progress made in the development of a number of types of electric furnaces. The initial issue of the paper contains a number of interesting articles, including "A History of the Development of Electric Furnaces," by T. F. Baily, president of the Electric Furnace Co., and "Electric Treatment of Ball Bearing Races," by F. T. Cope, vice president of the company. Among the principal articles in the February number are, "The Resistance Type Electric Furnace," by T. F. Bailey; "Waste in the Rolling Mill Casting Shop," by W. J. Pettis; and "Solving the Ever Increasing Cost of Central Station Operation," by R. F. Benginger. R. F. Fletcher is editor of the publication.

Special Vise Facilitates Repair of Drills

A special vise designed for the assembling and repairing of all types of pneumatic drills recently was developed by the Independent Pneumatic Tool Co., Chicago. The purpose of the vise is to firmly clamp and hold the drill in various accessible positions while the necessary repairs, assembling and testing are done. The vise consists of a flanged upright machine post or stand, a sliding stop collar, and a clamp which swivels on the collar and is securely held in any position by tightening a quick action clamp screw. The other end of the clamp is drilled to receive stems threaded at one end with ⅛, ½ or ¼-inch pipe threads respectively.

Gun Models Comprise Gift to Secretary

J. P. Sykes, vice president and operating manager of the Baldwin Locomotive Works, Philadelphia, accompanied by several officials of that company, has presented to the secretary of the navy, Josephus Daniels, models of gun mounts built by the navy during the world war for operations on shore.

These models, three in number, were constructed pursuant to the order of Samuel M. Vauclain, president of the Baldwin Locomotive Works, by the naval gun factory, Washington. The first is a 14-inch, 50-caliber navy gun installed on a railroad mount, five units of which were operated by the United States navy, under the United States army, along the western front from Sept. 6, 1918, until the armistice was effective Nov. 11, 1918. The second is a 14-inch, 50-caliber navy gun installed on a later type of mount designed to avoid the necessity of the hours preparation before firing which was required by the earlier type. This second type, known as the Mark II, did not reach France, but two such mounts were completed. The third

model is the 7-inch, 45-caliber navy gun installed on a caterpillar mount for field use. This was the mount built for the United States army and marine corps, but never was fired against the enemy.

The navy department states:

"The models represent a great degree of mechanical skill, being complete and workable in all respects even down to the smallest detail. They are on a scale of 1 to 20 and are so accurate that they can be used in future years by designers and draftsmen for inspiration and exact measurements.

"It is well remembered that it was due to the stand of Mr. Vauclain that these mounts were fabricated in the record time of some 72 days from the order, which great speed permitted their being on the firing line in time to be of utmost value to the French in the Soisson district and to the American army in the Argonne, Sedan and Metz during the great allied offensive."

New Ideas Are Reflected in Design of Twin Motor Driven Radial Drill

A TWIN motor driven, high-power, plain radial drilling machine has been designed along unusual lines by the Ryerson-Conradson engineers and is being marketed by Joseph T. Ryerson & Son, Chicago. It is suited to drilling, tapping, boring and reaming.

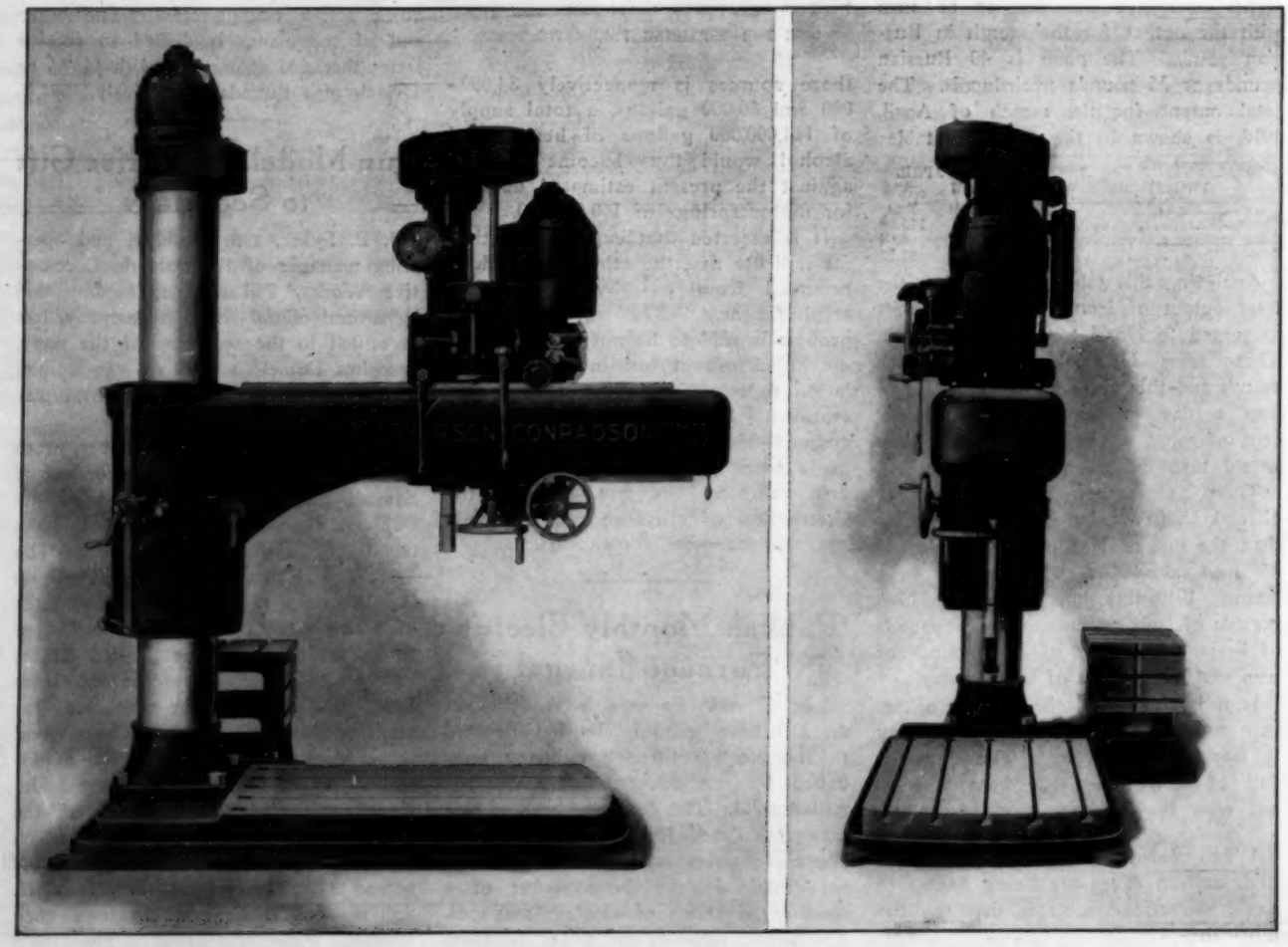
Former designs and styles apparently were discarded by the designer who has proceeded on original lines. The driving motor, usually found near the foot of the column, is mounted on the carriage on the arm. This leaves the area around the base free from all obstructions, except the work table, which as shown in the illustrations, is equipped with T-slots on vertical and horizontal surfaces.

The simplicity of this arrangement is indicated by the use of only four shafts and 16 gears, compared with 13 shafts and 33 gears in machines driven from the base. The spindle and driving shafts are all enclosed in a single cast box. Only spur gears are employed.

Sixteen spindle speeds from 19 to 310 revolutions per minute are obtained. For tapping, the motor is reversed, a simpler procedure than usual where friction clutches are employed for this purpose. Two series of eight feeds each, from .005 to .078-inch, derived from a cone of gears are provided. Instant disengaging of feed is obtained by a friction clutch on the hand wheel shaft and by an automatic or adjustable stop feeds are disengaged at the desired depth.

The arm is raised and lowered by an independent elevator motor mounted on the top of the column. A pinion on the armature shaft drives a reducing gear on the elevating screw, thrust being taken up by a ball bearing. Numerous details have been worked out differently from usual, such as design of the arm and its unusually firm clamping to the column, spindle travel on a radial line through the center of the column and unusually sturdy construction of the base.

Cast-iron dies are used principally in drawing wire, No. 20 or coarser, either by the wet or dry process. Steel dies are used principally for drawing fine and shape wires and are known as "plate dies."



TWIN MOTOR DRIVEN, HIGH-POWER, RADIAL DRILLING MACHINE

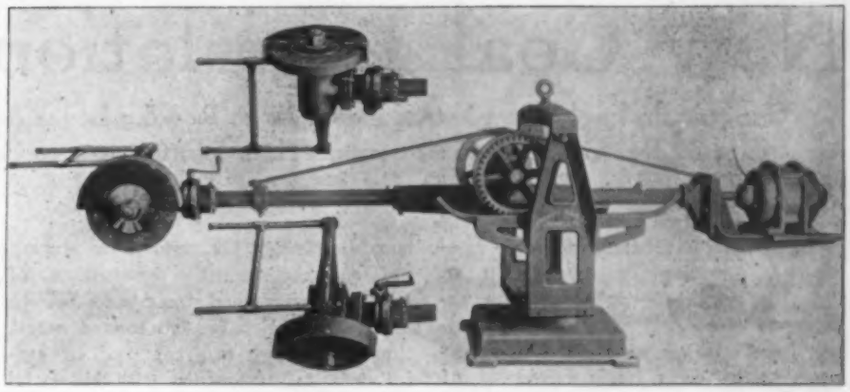
Portable Radial Grinder Is Self-contained

A compact portable radial grinder designed for heavy duty and hard service recently was developed by the Mummert-Dixon Co., Hanover, Pa. The grinder, which is 3 x 20 inches, is fully self contained. The frame is mounted on a substantial base and the trunnion connected with the frame and turning in the base is supported on ball bearings. The grinding head is equipped with heavy ball bearings, as is the trolley cross shaft. Large track wheels facilitate movement on the track. By turning a crank handle which engages a worm wheel, the head may be turned through a complete circle and held at any angle. This relieves the workmen from holding the wheel at the working angle.

The steel bevel gears, having a ratio of 5 to 6, are enclosed in an oil-tight gear case packed with transmission grease. The head and motor come to a horizontal poise when released by the operator due to a weight being suspended beneath the center of the cross trolley shaft.

When carrying the machine with a crane the cross trolley is held in a central position on the frame track by a lock pin in the frame which engages the teeth of one of the trolley wheels. All of the moving parts are encased except the lower working half of the grinding wheel. The motor mounting can be adjusted to any type or style of motor. The motor controlling apparatus may be mounted on the side of the frame but on account of its being rather cumbersome it usually is mounted on a nearby wall or post.

FIG. 1—NEW GRINDER FOR TAPER AND CLEARANCE OF TAPS



THE GRINDING HEAD CAN BE TURNED AND HELD AT ANY ANGLE

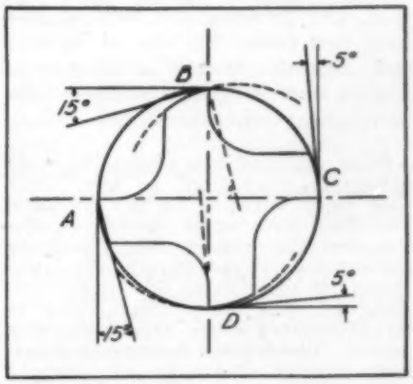


FIG. 2—FOUR METHODS OF GRINDING CLEARANCE ON TAPS

Designs New Machine for Grinding Taps

A new grinding machine, designed especially for grinding the taper and clearance of taps, recently was developed by the Grand Rapids Grinding Machine Co., Grand Rapids, Mich. The machine is shown in Fig. 1, while Fig. 2 illustrates a section of a four flute tap with each flute ground differently in the matter of clearance.

The flute *A*, to the left, is ground with a straight line clearance just sufficient so that it will have the heel of the flute actually clear and not drag. This condition is met by a clearance of about 15 degrees. General practice recognizes that this is excessive, and will weaken a cutting edge but with a straight line clearance, it is not possible to have less and retain any clearance at the heel, if the flute is as wide as indicated in the diagram.

The *B*, at the top, shows a 15-degree convex clearance, which is even more excessive. Flute *C*, at the right, shows a straight line clearance of 5 degrees. Nearly half of the flute at the back is not cleared at all, leaving the top to "ride" on that portion. Flute *D*, at the bottom shows a perfect grind for ordinary work. It is a 5-degree convex clearance, and shows that with this small but sufficient clearance angle at the cutting edge, the back is perfectly cleared.

The convex clearance, provided with the grinder shown in Fig. 1, is in the form of an arc of a circle, struck from a point on a radius laid out at a predetermined angle, in relation to the radius which forms the cutting face of the flute. In the case of flute *D*, this angle is 5 degrees; in flute *B*, it is 15 degrees; the dotted lines show the angle and also the arc of the circle thus provided for. Taper for any desired angle of entrance can be obtained at the point of the tap, and all flutes are ground uniformly. Right or left hand taps of all kinds with the possible exception of some types of staybolt taps, can be handled on this grinder. The machine accommodates taps from ⅜ up to 3 inches in diameter. It only is necessary to mount the tap between centers, swing it into the proper grinding position against the movable stop, and then oscilate the holder while the tap is in contact with the wheel. A spring tooth rest provides for indexing from flute to flute. The machine is provided with a diamond trueing device, complete with diamond.

The Reading Iron Co., Reading Pa., has advanced the rate of pay to its puddlers 75 cents. The new rate, effective March 1, is $11.75 per ton on a two months' basis.

New Coal Legislation Proposed

Senator Frelinghuysen Introduces Bills to Revoke Lever Act, Provide for Sale of Coal at 30 Per Cent Less in Summer Than Winter, and to Forbid Railroads to Seize Coal — Government Interference Is Blamed for Present Difficulties

WASHINGTON, March 23.—Looking to a solution of the acute problem with regard to the coal and coke situation and preventing of its recurrence, Senator Frelinghuysen, of New Jersey, has introduced three bills in the senate. One of the bills would revoke entirely the Lever act under which prices and distribution of fuel are controlled and provide for summer buying of coal at a reduction of 30 per cent below winter prices, so as to keep mines and cars busy throughout the year. Another would amend section 1 of the interstate commerce act and make it a misdemeanor for any railroad company to confiscate coal in the course of transportation over its line.

The third measure calls for the appointment by a federal coal commissioner with advisory powers. He would be selected by the President with the advice and consent of the senate, and serve five years at an annual salary of $10,000. The commissioner would be charged with investigation from time to time of the problem of distribution, storage and sale of coal. All of the measures, which appear to have considerable support, have been referred to the committee on interstate commerce, which will conduct hearings on them. Senator Frelinghuysen is chairman of the subcommittee which has been conducting a coal investigation.

Senator Frelinghuysen explained that Walker D. Hines, former director general of the railroads, acting under powers conferred upon him by Harry A. Garfield, former fuel administrator, is seizing coal and diverting it for essential industries. Stating that there is a classification of priorities and that among these prior industries are the railroads, the senator pointed out that the strike, weather conditions, the shortage of cars and a big export demand for coal have created a lack of coal from which the railroads are suffering. Because of this, it was said Mr. Hines is confiscating coal for the carriers and this has caused widespread complaints from industrial interests throughout the country. At present neither the government nor congress is paying any attention to the problem, he said. He told how during the summer months, production of coal was increased from 6,000,000 to 12,000,000 and 15,000,000 tons a week, thus preventing a great deal of suffering and interference with industrial enterprises.

Blames Government Interference

At present, however, he said that there is an abnormal situation, a government agency fixing prices, seizing coal, and throwing the flow of this important commodity out of its normal channels, thereby creating congestion and in many instances embarrassment to industries.

"The subcommittee of the interstate commerce committee," he said, "have paid some attention to this problem, and they have come to the conclusion that the primary difficulty at the present time is the government interference in price fixing and in distribution, and that the practical thing to do at present is to repeal the war powers, which were emergency measures, enacted simply for the purpose of controlling the coal supply during the war, and while there may be an acute situation temporarily eventually the law of supply and demand will regulate the distribution of coal and we will the more quickly get back to normal."

For this reason, he explained, the subcommittee had presented a bill to terminate all powers with respect to coal and coke conferred on the President by the Lever act. It provides that after its enactment the President will have none of the powers the act confers on him, but in order to wind up the various matters arising out of federal control it is provided that all powers necessary for this purpose may be exercised for 30 days after the measure becomes a law.

In replying to a question by Senator Norris, Senator Frelinghuysen stated that it is the opinion of the office of Mr. Hines that the existing shortage of coal and cars will be relieved by May 1. Senator Edge of New Jersey inquired if Senator Frelinghuysen thought the proposed legislation would ultimately bring about a reduction in the price of coal and the latter replied that he did not think so, but that there will have to be further legislation which will directly affect not only the price of coal but the present restless condition of labor at the mines. The senator had reference to his bill to encourage purchasing in summer more freely.

Speaking of worldwide need of coal, Senator Frelinghuysen expressed the opinion that it was the greatest in history. If mines of the country are operated with the present number of miners, he said, about 500,000, 230 days a year, 800,000,000 tons of coal can be produced in this country. The needs of the country are approximately 500,000,000 tons, it was declared, while Europe will need from 100,000,000 to 150,000,000 tons.

Speaking of the car shortage, Senator Frelinghuysen said he understood there are many coal cars still in the West and Northwest that have not been returned to mining regions, but that the railroads are getting them back as quickly as they can.

The bill to encourage buying of coal in summer months, it was stated, will in general require freight rates on coal to be 15 per cent below the tariff rates in the fall and winter. This, it is hoped, would encourage consumers to develop storage accommodations, to accept deliveries of coal in advance of their seasonal needs and thus keep the mines operating more constantly throughout the year. Under present conditions, it was pointed out, during the winter the demand so nearly equals the currently available supply that scarcity prices prevail. In addition to this, it was said, the actual cost of production per ton is enhanced unduly because the operator must, during the time his mine is closed down or working intermittently, keep together his organization and expend money for the upkeep and maintenance of the property, all of which must be added to the price of coal. The suggested bill to remedy this situation, it was asserted, reflects the views of Chairman E. E. Clark, of the interstate commerce commission, who further agrees that the legislation would obviate largely the pressing necessity or more coal cars. Under the present system, it was declared, thousands of coal cars lie idle during the spring and summer, while the whole

available supply is insufficient during the winter.

The proposed legislation prescribes that the carriers shall file their tariff rates on coal in the same manner as at present, and, instead of requiring them to alter these tariffs semiannually, provides an automatic statutory differential below the tariff for the remainder of the year, with discretion in the interstate commerce commission to change the amount of the differential where it finds it necessary. It also was stated that the revenues of the carriers would not be affected. If the 30 per cent differential between the months of April and August, inclusive, should prove an unnecessarily large inducement, so that too great a proportion of coal is shipped during this period, Senator Frelinghuysen said, the commission is authorized to change the percentage so as to balance the summer and winter shipments properly.

Plan Will Effect Saving

Chairman Clark has estimated that the plan would release 250,000 coal cars which are idle during the spring and summer months and it also has been stated that it will save $1,000,000,000 a year to the country in the prevention of wastage that now exists. Senator Frelinghuysen said it may be urged that the interstate commerce commission act now contains ample provisions to permit the commission or the carriers to institute lower summer freight rates for coal. The conclusive answer to this contention, he said, is that during the many years that the same provisions have been law this practice has never been introduced. When the carriers have been asked to initiate such seasonal rates on coal, he stated, the request has usually been coupled with a demand that while rates may be lowered in summer, they should not be raised in the winter.

Would Combine Foreign Trade Efforts

WASHINGTON, March 23.—Consolidation under one head of control over efforts made to develop the foreign commerce of the United States is recommended by the government bureau of efficiency in a special report to the house of representatives. The report, transmitted by letter from Herbert D. Brown, chief of the bureau, points out that 14 separate government agencies are engaged in foreign trade promotion activities, with five of them conducting the work to a large extent. Co-ordination of efforts would result not only in a financial saving to the United States, it is stated, but would eliminate considerable energy wasted in duplication or opportunity for duplication of the work. The report specifically recommends:

"That all resident foreign trade agents of the United States government stationed abroad shall be assigned to the department of state.

That all departments contemplating sending trade investigators or other trade agents abroad shall first confer with the secretary of commerce who should be given full power to determine the lines of all trade investigations to be conducted in foreign countries.

"That all government agents abroad whose work regularly or incidentally results in the collection of foreign trade information of any description be required to send the data thus collected to the department of commerce through the department of state for publication and dissemination by the department of commerce or for transmission to other branches of the government service for such use as they may deem proper."

"While it is impossible to estimate in dollars and cents just what savings would accrue to the government if the recommendations made by the bureau of efficiency are put into effect," the report says, "it is safe to assume that they will amount to many thousands of dollars annually. These savings would result from lesser office expenses and overhead charges by having all foreign resident trade agents under the control of one government department and by having the field and scope of all foreign trade investigations determined by one responsible government official."

The 14 departments exercising some control in matters of foreign trade are, according to the report, the departments of commerce, interior, treasury, state and agriculture, the federal trade, interstate commerce, tariff and international high commissions; the federal reserve and shipping boards, the Pan American Union, the War Finance corporation and, until recently, the railroad administration. The five most directly active in this work are the commerce, state and agriculture departments, the international high commission and the Pan American union.

While no estimate is made of the total number of persons employed by each department in foreign commerce work, the report shows at least 1300 persons are resident or traveling in foreign countries in this endeavor. Of these, 700 are ship "supercargoes" who gather such information as they can at the ports at which they touch, all over the world. Six hundred others are resident or traveling representatives of whom only 66 devote their full time to the work, the others being otherwise engaged in diplomatic, notarial, commercial and other duties.

Despite the apparent wasted efforts and duplication of functions, the estimated expenditures for all departments for foreign trade promotion this year are, according to the report, less than one-tenth of 1 per cent of total volume of foreign trade of the United States in the last fiscal year. The estimated expenses this year reach $2,105,150, with $1,043,710 going to the department of commerce, $890,000 to the department of state, $26,380 to the department of agriculture, $100,000 to the Pan American union, $25,000 to the international high commission and $20,000 to the tariff commission.

Most of War Trade Rules Canceled

Washington, March 23.—That the war trade board section of the state department has removed most of the restrictions it exercised during the war was made clear in a letter written by Frank L. Polk, former acting secretary of state, to Secretary of the Treasury David F. Houston, and transmitted by the latter to the house of representatives. The letter was written in connection with a request that congress reappropriate to the war trade board section the unexpended balance, estimated at $50,000, which it will have on hand as of June 30, this year. The appropriation is wanted in order that the board will be able to perform certain work in winding up its affairs, such as liquidation of its finances, settling its obligations and answering numerous inquiries that come to the board from private individuals as to contracts and other matters. In addition, Mr. Polk said, the department receives many inquiries from foreign governments with relations to rules, regulations and the accounts of the board affecting foreign nationals and shipping interests. Proper replies, it is stated,

are dependent upon careful investigation which requires continuance of the trained personnel which is acquainted with the files of the board.

Since the duties of the war trade board were transferred to the department of state the latter has continued the policy already adopted by the board of removing as rapidly as possible control over exports, imports and enemy trade, so that the only authority it now exercises is as follows: Control over exports to and imports from European Russia; control over exportation of arms, ammunition and explosives to China; control over exportation of certain types of munitions of war to the republics of Austria, Hungary, Bulgaria and Turkey, and control over importation of dyestuffs and chemical drugs.

Navy Opposes Tariff on Tungsten Ore

Washington, March 23.—Because of the effect of a duty on tungsten ore and cost to the navy on high speed steel, and its like effect on industries of the country, the bureau of steam engineering, navy department, through its chief, Admiral Robert S. Griffin, has written a letter to the house committee on ways and means and the senate committee on finance, opposing proposed tariff legislation on tungsten ore and high speed steel. The position of the navy department has been approved by both Secretary Josephus Daniels and Assistant Secretary Franklin D. Roosevelt. The letter clearly explains the great value of high speed steel, saying that it has increased the efficiency of machine tools from three to five times.

Members of both the house and senate committees who favor tariff protection on this commodity say the letter itself justifies encouragement to the domestic industries. It is understood that a letter to this effect has been addressed to Secretary Daniels by the subcommittee of the committee on finance which recently ordered a favorable report on the tungsten bill. The bill provides a duty of $1.50 per pound on the tungsten content of high speed steel and of alloy steel containing tungsten, as compared with a duty of $1 carried in the bill as it passed the house. It is maintained that the increase in the price of tungsten, which the navy department says will result from the fixing of tariff duties, would not be sufficient reason for lessening the use of tool steel by industries of the United States.

It is estimated, the letter says, that the navy during the present year will use 136,339 pounds of grade No. 1 high speed steel containing 16 to 20 per cent of tungsten, and it will use 11,380 pounds of grade No. 2 tungsten steel containing 3 to 5 per cent tungsten. The present average price of grade No. 1, it is stated, is $1.47 a pound and of grade No. 2, $2.65. The total cost for grade No. 1, therefore, would be $200,418.33, and of grade No. 2, $7397. The increased cost to the navy, according to the letter, if the house duty goes into effect will be $30,675 for grade No. 1, and $596 for grade No. 2.

Reject Locomotive Bids

Washington, March 23.—Bids on the 200 Decapod locomotives, built for use in Russia and offered for sale by the chief of engineers of the war department, have all been rejected due to the fact that they were so varied and irregular that none of them was satisfactory, according to the director of sales. Bids for these locomotives and certain box cars and gondolas will be reopened by the chief of engineers.

Leases War Plant

Announcement is made that the General Electric Co. has leased, with option to purchase, the 40-acre war plant of the Remington Arms Co., Bridgeport, Conn., and will utilize these facilities for its line of manufacturing. The transaction is said to involve approximately $7,000,000. This plant was built in 1915-16 and covers 900,000 square feet. It has a floor area of 1,555,257 square feet or over 36 acres. Buildings are divided into four groups, as follows: First, 13 main 5-story buildings; second, the drying kiln; third, five 1-story buildings used as guard quarters; and fourth, two storage buildings. All buildings are on the same level and connected on each story with a corridor running through the entire 13, which facilitates the delivery and movement of material.

The plant is expected to be in full operation by April 15. Housing facilities already have been arranged but no announcement as yet has been made as to what will be produced.

At a meeting of the Philadelphia Foundrymen's association held March 10 at the Manufacturers' club, Philadelphia, F. J. Ryan, general manager of the American Metallurgical Corp., Philadelphia, presented a paper on electrically heated core ovens and low temperature work in electric core ovens. The paper was illustrated by lantern slides.

Increasing Output

Shown by Dominion Steel Corp.—Canadian Statistics for 1919 Given

Toronto, Ont., March 22.—Production of the Dominion Steel Corp., Sydney, N. S., is steadily on the increase. Up to the present, but two of the six blast furnaces have been in operation. A third furnace is now being heated preparatory to relighting. It is the general hope and expectation, that the entire plant, within a comparatively few weeks will be operating to its full capacity. Information has also been handed out that a large order for rods and bars has been secured by the company from the Japanese government which is sufficient to keep the rod and bar mill in operation for several years. The mill has been out of operation for seven or eight months but workmen are now engaged making necessary repairs and adjustments to the mill and it is expected that rolling of the new order will be started at once.

The shipments of iron ore from Canadian mines in 1919 were the lowest that have been recorded in 19 years and amounted to a total of 195,970 tons as compared with 211,608 tons shipped in 1918. The total production of pig iron in Canada in 1919 excluding that of ferroalloys was 917,346 short tons, as compared with a total production in 1918 of 1,195,551 short tons. The production of steel ingots in 1918 is estimated at 1,020,000 tons and of electric steel including castings at 15,000 tons. The output of steel rails in 1919 was 316,304 tons the greatest since 1914 when 428,226 tons were rolled.

To Install Foundry

Plans now are being developed by the Salisbury Iron Corp., Lime Rock, Conn., for the installation of a foundry in a large building adjoining its charcoal iron blast furnace at East Canaan, Conn. This building was built only a few years ago and for three years was used as a charcoal chemical plant by the Connecticut Chemical Co., a subsidiary of the Barnum-Richardson Co., predecessor of the Salisbury Iron Corp. The latter company now operates two foundries at Lime Rock, and the new one will be in addition to these two. Production at the new foundry at East Canaan will be specialized in charcoal iron and chilled iron castings.

The American Mfg. Co., Atlanta, Ga., maker of saw mills, lath machines, bolters, etc., recently doubled its foundry capacity.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

AT HUBBARD, O., a suburb of Youngstown, the Powell Pressed Steel Co. is erecting a modern plant for the manufacture of light and heavy pressed steel stampings. It is expected that production will commence in May. The plant will be constructed in units on an 18-acre site, the initial one to have 55,000 square feet of floor space. Contract for excavation and concrete work was awarded the Henderson Construction Co., and the erection of structural steel to the Hunter Construction Co. Machinery has been ordered. Stockholders have elected the following directors W. J. Powell, H. S. Wylde, E. J. Powell, Ward Beecher, C. A. Cochran, George F. Alderdice and A. M. Henderson. Officers have been elected as follows: W. J. Powell president and general manager; H. S. Wylde, vice president and sales manager; E. J. Powell, secretary and engineer; treasurer Ward Beecher, formerly treasurer of the Lau Iron Works; purchasing agent, J. L. Doyle, formerly discharged similar duties for the Youngstown Pressed Steel Co., Youngstown. The first three formerly were general superintendent, assistant sales manager and engineer and chief estimator, respectively, of the Youngstown Pressed Steel Co.

* * *

APPLICATION for a Pennsylvania charter for the Pittsburgh Locomotive Power Reverse Gear Co., Pittsburgh, will be made April 5. The company will engage in the manufacture of mechanical appliances and accessories for railroad use and power reversing mechanism for locomotives.

* * *

AN ADDITION is being built to its Woodlawn works, near Birmingham, Ala., by the Conners-Weyman Steel Co., manufacturer of steel hoops, bands and specialties. Structural steel is being fabricated by the Birmingham Steel Corp., and construction is to be completed within 90 days.

* * *

FOR the manufacture of cast iron soil pipe and fittings, a plant will be constructed at once by the Emory Foundry Co., Anniston, Ala., recently organized. H. B. Rudisill is president and Frank Morgan is secretary. The plant is to be in operation by July 1, according to a statement by those interested.

* * *

THE Ingalls Iron Works, Birmingham, Ala., is fabricating the steel for the rebuilding of that portion of the plant of the Birmingham Machine & Foundry Co., Birmingham, damaged by fire a few weeks ago. Modern equipment is being installed including large planing machinery. Many orders are on hand for sugar refinery machinery.

* * *

PREFERRED stock of the Buzz Engineering Co. Inc., Louisville, Ky., manufacturer of conveyors and pumps, recently was retired and all of its $100,000 stock now is common. It expects to enlarge its plant this spring and will be in the market for electrically-driven machinery and heating equipment.

* * *

A 2-STORY annex, 120 x 123 feet costing $125,000, is to be built by the Advance Spring & Wire Co., Frederick C. Mueller president, Carroll avenue and North Wood street, Chicago. Property adjoining the company's plant has been bought for the purpose. Coiled wire springs for automobile and furniture trade make up the product.

* * *

ORDERS for the installation of stove linings at the blast furnaces of the Struthers Furnace Co., Zenith Furnace Co., and the Shenango Furnace Co., recently have been received by Freyn, Brassert & Co., 645 Peoples Gas building, Chicago. These engineers recently placed eight stove burners for the hot blast stoves of the Wharton Steel Co., Wharton, N. J.

* * *

FOR the manufacture of nonexplosive gasoline containers of all kinds, the Columbia Safety Appliance Co., Columbia, Ind., has been incorporated with a capital stock of $35,000. Cans, automobile tanks, storage tanks, etc., are some of its products for which it has ample manufacturing facilities so that machinery and equipment needs will be limited for the present. Officers follow: President, Jay Stuckman; vice president, T. L. Hildebrand; treasurer, J. W. Adams; and secretary, Ernest Cotterly.

* * *

THE Motor Pattern Co., Cleveland, recently incorporated with $50,000 capital, has erected a 1-story building, 50 x 160 feet, equipped with the most modern machinery for the manufacture of wood and metal patterns. A brass and aluminum foundry will be operated in connection with the plant. The company specializes in cylinder patterns. H. R. Street is secretary.

* * *

ALL apparatus has been contracted for by the Tonawanda Power Co., North Tonawanda, N. Y., to enable it to increase from 10,000 to 20,000-horsepower capacity and to add 1250 kilowatts to its 60-cycle lighting capacity, except copper wire, insulators, etc. This latter equipment will be purchased in the near future. A. S. Allen is superintendent.

* * *

A FINANCIAL interest in the George Cutter Co., South Bend, Ind., manufacturer of electric lighting equipment, has been acquired by the Westinghouse Electric & Mfg. Co., East Pittsburgh. The management and commercial policies will remain unchanged, and the Westinghouse company will operate as sole distributor for the Cutter company's products.

* * *

THE Forged Products Co., 111 West Washington street, Chicago, has sold the buildings and ground of its plant at Champaign, Ill., covering 10 acres, to the Locomotive Crane Co. of America, 122 South Michigan avenue, Chicago. The forging equipment has been disposed of elsewhere. The buyer will equip the plant for the manufacture of a special type of locomotive crane it has recently developed.

* * *

A PENNSYLVANIA charter recently was granted the Lake Erie Foundry Co., Girard, Pa., which succeeds the old company of the same name, dissolution and reorganization of which under a new charter recently was allowed by the Erie county court. The new company is capitalized for $50,000 and the incorporators are John A. Zurn and John F. Schneider, of Erie, Pa., and William C. Shafer, of Girard.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

WORK has begun on construction of the new plant of the Buffalo Steel Car Co., at Cheektowaga, near Buffalo. Within three months it is expected operations will be under way partially at least. The company was organized in December to engage in manufacture and repair of steel cars for railroad use. It occupies a site between the New York Central and West Shore railroads and has spurs from both. A 90-acre site gives it room for future extensions. The new industry is headed by Robert H. Parks. Other officers are Carlton M. Smith, vice president; Joseph Dudley, secretary; and Edward N. Mills, treasurer. Its general offices have been opened in the Fidelity building, Buffalo.

* * *

WITH its machinery requirements practically all booked, the Cadillac Metal Parts Co., Cadillac, Mich., will build a new plant as soon as weather conditions permit. It is capitalized at $20,000 and is the outgrowth of a branch of the Cadillac Plumbing & Heating Co. business, which manufactured sheet metal products for trucks, tractors and automobiles.

* * *

CATALOGS showing plate planers are desired by the Milwaukee Reliance Boiler Works, Milwaukee. It is building an addition to its present boiler plant, 60 x 280 feet, which will be a steel and concrete building. It will be equipped with a crane with 60-foot span but no other purchases of machinery are contemplated at this time, except with the possible exception of a plate planer of sufficient size to take plates 12 feet wide.

* * *

CAPITALIZED at $1,000,000, the Southern Automobile Mfg. Co., Inc., Memphis, Tenn., recently was incorporated and plans to engage in the manufacture of automobiles, trucks, tractors and tires. A new plant will be erected construction to begin within the next 30 days, and necessary equipment will include woodworking machinery, sheet metal machinery, machine tools, etc. Officers are: President and general manager, W. A. King; vice president, Lovick P. Miles; secretary and treasurer, W. A. Shibley, and general sales manager, W. B. Frazee. The company's office is at 117 Linden street, Memphis.

* * *

BECAUSE its present quarters are inadequate, the Farmers Barn Equipment Co., Fourteenth and Monroe streets, Two Rivers, Wis., has purchased suitable manufacturing quarters and grounds at Stevens Point, Wis. Some additional machinery and equipment has been purchased and it will occupy the new location about April 1. Shipping facilities will be greatly improved since the new location is more centralized.

* * *

ERECTION of two buildings is contemplated by the Northwestern Malleable Iron Co., Milwaukee, for the manufacture of brake beams and bolsters. The first will be 140 x 200 feet and the bolster plant will be 70 x 200 feet; both will be of brick and steel construction. They are being built under the name of the Joliet Railway Supply Co., Chicago, owned and controlled by the Northwestern Malleable Iron Co. Equipment requirements have been awarded.

* * *

CONSIDERATION is being given at present to the erection of a foundry, 30 x 130 feet, this spring by Gust. Lagerquist, 514-520 Third street north, Minneapolis, manufacturer of elevators, electric motors, etc. A 2-story pattern and cleaning shop building, 16 x 50 feet, also will be erected. A No. 2½-B cupola has been ordered from the Whiting Foundry Equipment Co., Harvey, Ill. Additional equipment is to be ordered later. The output will be used in the manufacture of elevators.

* * *

THE Evansdale Clay Products Co., Morgantown, W. Va., recently incorporated, has elected the following directors: Otto Schenk, H. W. Campbell, F. G. Stroehmann, W. D. Watkins, George W. Roe, G. L. Vieweg, H. A. Henderson, Fred Faris and C. Friedrichsen, of Wheeling; J. H. McGrew and D. H. Courtney of Morgantown. The directors have organized as follows: President, Otto Schenk; vice president, J. H. McGrew; secretary and treasurer, H. W. Campbell, and general manager, C. Friedrichsen.

* * *

THE Montana Tractor Co., Tinely Park, Cook county, Ill., proposes to erect a plant at Peshtigo, Wis., the first unit of which will have 40,000 square feet of floor space. It will be of standard steel, brick and concrete construction and cost including machinery $150,000. Other units will be added as required at an expenditure of approximately $500,000. This plant is to facilitate the output of farm tractors through the North, Northwest and Canada, the Cook county plant supplying the demand in the Middle States, South and South America.

* * *

AT THE annual meeting of the International Steel Tube Co., Cleveland, the following directors were elected:

William P. Day, president International Steel Tie Co.; A. Ward Foote, former president Foote-Burt Co.; R. A. Harman, president Cleveland City Iron & Forge Co.; J. B. Hull, Hull, Smith, Brock & West; C. H. Olds, Smith, Olds & Smith; C. H. Hopkins, all of Cleveland; W. J. Moltrup, Beaver Falls, Pa.; Thomas Parrock, Youngstown; H. E. Smythe, Pittsburgh.

* * *

AT THE annual meeting of the stockholders of the Newark Stamping & Foundry Co., Newark, O., the following directors were elected; J. N. Pugh, president, J. N. Pugh & Co., brokers; F. W. Moser, R. G. Barber, C. F. Sites and E. F. Ball, Newark, O.; R. A. Gulick, secretary, May-Fiebeger Co., Akron, O., and Goodnow Johnson, manager, Bellaire Stove Co., Bellaire, O. These will meet at a later date for organization and election of officers. At this meeting it was decided to double the capital stock of the company to $30,000. The May-Fiebeger Furnace Co., is a subsidiary company, selling the Newark Stamping & Foundry Co.'s line of warm air furnaces. The stamping department manufactures automobile accessories.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Holyoke Foundry Co., Holyoke, Mass., recently incorporated with $60,000 capital, has taken over the McHugh Foundry Co. in that city. A. J. Britton, recently superintendent of the Capitol Foundry Co., Hartford, Conn., is vice president and general manager, and Harry M. Lee of the Bond Engineering Works, Toronto, Can., treasurer and in charge of the business management. The foundry is rented from the Holyoke Heater Co., which recently purchased it from John P. McHugh, Edward T. McHugh and Charles H. House, for about $50,000. The occupants of the building will be the Holyoke Heater Co., the Holyoke Foundry Co. and C. H. House, formerly of the McHugh Foundry Co., who will operate a machine shop.

* * *

BECAUSE of its rapid growth during the past three years, during which it was operated as a partnership, the Peck Spring Co., Plainville, Conn., has been incorporated. While it added floor space by building and equipping a factory a few months ago, this now is inadequate and the erection of another factory in the spring or summer is contemplated. It specializes on helical springs, hair springs for watches, clocks, etc., and pressure gages for air, steam and electrical purposes. D. C. Peck is president and secretary; D. K. Peck is treasurer and general manager.

* * *

THE Strauss Bascule Bridge Co., 104 South Michigan avenue, Chicago, engineer and designer of movable bridges, now is preparing complete general plans and specifications for a 180-foot single leaf double track railroad bridge for the Erie railroad at Newark, N. J It also has prepared preliminary plans and estimates which will be voted upon by the city of Racine, Wis., for a 133-foot double leaf highway bridge. The department of public works and labor, province of Quebec, has awarded a contract to the McKinnon Steel Construction Co., Sherbrooke, Que., for a 62-foot single leaf highway bridge calling for the bascule bridge built by the Strauss company. A contract for the general detail plans has been awarded to the Strauss company by the Itasca county, Minnesota, commissions, for a 64-foot single leaf highway bridge and plans and specifications now are being prepared. The city of Victoria, B. C., and Canadian Pacific railroad are having general plans prepared for a 150-foot single leaf combined railway and highway bridge at Victoria, B. C., by the Strauss company.

* * *

ORGANIZED to manufacture sheet metal parts for automobiles and trucks, the Manistee Steel Products Co., Manistee, Mich., will install complete equipment of stamping presses, etc. It has purchased a fireproof building with approximately 25,000 square feet of floor space. Capital stock is $100,000 and it has been operating in a small way for about a year. Officers and directors are all Manistee business men, namely, William Lloyd, Thomas Smurthwaite, Oscar Lundbohm, H. W. Wolfe, Edward Turner, B. D. Noud and O. L. Larson. A. H. Horton is general manager.

* * *

COMBINING a machine shop, foundry and plating shop, the Powow Mfg. Co., 22 Oakland street, Amesbury, Mass., recently was organized with a capital of $50,000 and has purchased the Baker Foundry & Machine Co., and the Amesbury Lamp & Plating Co. Its principal line of business is the production and finishing of castings, fixtures and other accessories for automobile bodies but it also does all kinds of brass and aluminum foundry and machine shop work. Officers are Henry Miller, president; Edmund K. Arnold, vice president, secretary and general manager; and James H. Walker, treasurer.

* * *

THE A. H. Steel Co., Worcester, Mass., doing a drop forging business has been reorganized and incorporated as the Rogers Drop Forging Co. Francis W. Rogers Jr., the new manager, also is manager of the A. Hankey & Co., Inc., Rochdale, Mass., manufacturer of machine knives and drop forgings. The new company will have a capital of $150,000 and is planning extensive increases to its plant during the present year. Already the reorganized company has purchased forging machines and machine tools. J. R. Rogers is president, Francis B. Rogers Jr. is treasurer and J. E. Rogers is secretary.

* * *

ALL assets and liabilities of the Pasteur-Chamberland Filter Co., Squier Filter Co. and the Dayton Water Motor Co. have been taken over by the American Mfg. Co., Dayton, O., which was recently incorporated with $100,000 capital. The company will continue the manufacture of washing machines and will also engage in a general manufacturing business consisting of brass and aluminum castings, polishing and plating, metal spinning and general tool and machine work. Officers of the new company are: President and treasurer, A. B. Hilton Jr.; vice president, J. H. Hosstetter, and secretary, Joseph W. Green.

* * *

INCORPORATED under the laws of the state of New York, with $100,000 in 8 per cent preferred and $150,000 common stock, the Ryan Corp., Phoenix, N. Y., will take over the assets of the M. C. Ryan Co., that city. The latter company was established in 1904 to manufacture flashers, hinges, traffic signals and other hardware products. The directorate of the new corporation comprises the following: Arthur L. Jones, Syracuse, N. Y., director of the Jones Oil Engine Corp.; A. C. Parker, Phoenix, N. Y., retired merchant; Thaddeus C. Sweet, Phoenix, president of the Sweet Bros. Paper Co. Two other directors are to be added. C. A. Larned, who has been manager of the plant for several years, will continue as general manager. Additional buildings will be erected as the business demands and additional machinery will be installed for the manufacture of regular products and a new traffic signal. The corporation maintains an office in Syracuse, 925 University block. The plant is equipped to handle metal stamping and die work.

Collective Bargaining Is Upheld

President's Second Industrial Conference Recommends Employe Representation as a Preventative of Industrial Ills, and Outlines Plan for Voluntary Arbitration Except for Policy of Open Shop — Makes Many Suggestions

STRONG endorsement of the principle of collective bargaining through a system of employe representation wherein employes may choose their own representatives is contained in the final report of the President's second national industrial conference issued last week. This was the point on which the first industrial conference disagreed and caused that body to adjourn leaving employers and employes alike in doubt as to what general rules might be followed as a national policy.

The final report differs from the tentative draft issued for comment and criticism by employers and employes some weeks ago in this particular: "It diminishes the field of arbitration and enlarges the scope of voluntary settlement by agreement." In doing this it prescribes a minimum of regulation, invokes no legal authority for adjustment purposes except the right of inquiry, states that no penalties shall be imposed and that industrial workers shall retain the right to strike. In enlarging the scope of voluntary settlement by agreement it puts the stamp of its approval on employe representation, as to the value of which there is much difference of opinion among employers, employes and representatives of trades unions. Employe representation as expressed in various forms, such as shop committees, "industrial republics." "industrial democcracies," etc., is held to afford an ideal means of preventing industrial unrest, regardless of the fact that recently some objection has been urged against it as tending to inject politics and "soviet control" into shop management.

BELIEVING the final report of the President's second industrial conference should receive much discussion, and may have an important influence on future industrial relations, THE IRON TRADE REVIEW *has made arrangement for its publication in full, in addition to the general summary. In this issue the conference's own summary of the labor situation and its summary of its plan for prevention of disputes are presented. The remainder of the report will be published in subsequent issues.*

Further, in clearing up a point on which there has been much controversy, the report "does not submit to arbitration the policy of the closed or open shop." On this point it upholds the position taken by the employers during the strike in the iron and steel industry. As developed by the senate committee's investigation, the employers refused to compromise the policy of the open shop, and the conference writes this policy into its report as the accepted American principle. The freedom of labor to organize, however, is defended and employe representation may be "union representation" where shops are already unionized. Abridgement of union activity is not contemplated.

Some of the board's conclusions on labor relations are as follows:

"Considered from the standpoint of public interest, it is fundamental that the basic wages of all employes should be adequate to maintain the employe and his family in reasonable comfort, and with adequate opportunity for the education of his children.

"A schedule of not more than 48 hours a week is favored for most industries, and there should be in all cases provision for one day's rest in seven.

"Profit sharing and gain sharing are regarded as promising improved industrial relations.

"Public employes must be treated fairly but their right to strike is denied. Policemen and firemen should not join organizations which resort to strike.

"The establishment by congress of a national employment clearing house, supervising a system of state employment offices in a co-operative relation between federal and state governments is recommended."

The following are the initial installments of the report in full:

Industrial Conference's Report in Detail

I—INTRODUCTION

THE industrial conference was convened by the President on Dec. 1, 1919. Under date of Dec. 19 it issued for publication on Dec. 29, a tentative plan of machinery to adjust disputes in general industry by conference, conciliation, inquiry and arbitration. Criticism and constructive suggestions from the public were requested.

The tentative report provided for the adjustment of disputes rather than their prevention. The purpose of the conference in publishing that report was to obtain at the earliest moment constructive criticism of the plan for adjustment, while the conference was engaged in the further development of methods of prevention.

The conference reconvened on Jan. 12, 1920. It has received a vast amount of helpful comment from individuals and organizations in all parts of the country and it has also had the assistance of leading representatives of capital and labor, speaking for large numbers of employers and employes, who have come before it in frank consultation. This material has been carefully weighed.

The conference now proposes joint organization of management and employes as a means of preventing misunderstanding and of securing co-operative effort. It has modified the tentative plan of adjustment so as to diminish the field of arbitration and enlarge the scope of voluntary settlement by agreement. As modified the plan makes machinery available for collective bargaining, with only incidental and limited arbitration. The conference has extended the plan to cover disputes affecting public utilities other than steam railroads and it has enlarged it to cover the services of public employes.

The present report also deals with a number of specific subjects consideration of which should underlie any approach to the industrial problem. Some of these are matters of current controversy.

The causes of industrial unrest are many. Among others, they include the rise in the cost of living, unrestrained speculation, spectacular instances of excessive profits, excessive accumulation and misuse of wealth, inequality in readjustments of wage schedules, release of ideas and emotions by the war, social revolutionary theories imported from Europe, the belief that free speech is restricted, the intermittency of employment, fear of unemployment, excessive hours of work in certain industries, lack of adequate housing, unnecessarily high infant mortality in industrial centers, loss of personal contact in large in-

dustrial units and the culmination of a growing belief on the part of both employers and employes that a readjustment is necessary to a wholesome continuity of their united effort.

For the most part causes of unrest are not the result of the war; they have been accentuated by it. Much investigation and public discussion have been devoted to these matters. The relative importance and emphasis laid on the different causes varies with each investigator. The conference, in Part IV, has made suggestions for dealing with some of the conditions enumerated, and it hopes that progress toward remedying them may be accelerated by the further development of employe representation and by the use of the suggested machinery for adjustment.

There is, however, a feature of the present industrial unrest which differentiates it from that commonly existing before the war. It cannot be denied that unrest today is characterized more than ever before by purposes and desires which go beyond the mere demand for higher wages and shorter hours. Aspirations inherent in this form of restlessness are to a greater extent psychological and intangible. They are not for that reason any less significant. They reveal a desire on the part of workers to exert a larger and more organic influence upon the processes of industrial life. This impulse is not to be discouraged but made helpful and co-operative. With comprehending and sympathetic appreciation, it can be converted into a force working for a better spirit and understanding between capital and labor, and for more effective co-operation.

The wisest suggestions for the prevention and relief of industrial unrest are to be found by interpreting the best thought and experience of those employers and employes who, within the era of their own activities, have most successfully dealt with the problem. The conference in making its final report has considered the interpreting of actual achievements its most useful function. It believes that practical experience is more useful than the views of extremists on either side. Such experience shows that no group of men can successfully undertake to deal with the interests of other groups without their co-operative participation in the methods of equitable adjustment.

The guiding thought of the conference has been that the right relationship between employer and employe can be best promoted by the deliberate organization of that relationship. That organization should begin within the plant itself. Its object should be to organize unity of interest and thus to diminish the area of conflict, and supply by organized co-operation between employers and employes the advantages of that human relationship that existed between them when industries were smaller. Such organization should provide for the joint action of managers and employes in dealing with their common interests. It should emphasize the responsibility of managers to know men at least as intimately as they know materials, and the right and duty of employes to have a knowledge of the industry, its processes and policies. Employes need to understand their relation to the joint endeavor so that they may once more have a creative interest in their work.

Industrial problems vary not only with each industry but in each establishment. Therefore, the strategic place to begin battle with misunderstanding is within the industrial plant itself. Primarily the settlement must come from the bottom, not from the top.

The conference finds that joint organization of management and employes where undertaken with sincerity and good will has a record of success. The general principles governing such organization are stated at length under the title, Employe Representation. It is not a field for legislation, because the form which employe representations should take may vary in every plant. The conference, therefore, does not direct this recommendation to legislators but to managers and employes.

If the joint organization of management and employes in the plant or industry fails to reach a collective agreement, or if without such joint organization, disputes arise which are not settled by existing agencies, then the conference proposes a system of settlement close at hand and under governmental encouragement, and a minimum of regulation. The entrance of the government into these problems should be to stimulate further co-operation.

The system of settlement consists of a plan, nation wide in scope, with a national industrial board, local regional conferences and boards of inquiry, as follows:

1.—The parties to the dispute may voluntarily submit their differences for settlement to a board, known as a regional adjustment conference. This board consists of four representatives selected by the parties, and four others in their industry chosen by them and familiar with their problems. The board is presided over by a trained government official, the regional chairman, who acts as a conciliator. If a unanimous agreement is reached, it results in a collective bargain having the same effect as if reached by joint organization in the shop.

2.—If the regional conference fails to agree unanimously, the matter, with certain restrictions, goes, under the agreement of submission, to the national industrial board, unless the parties prefer the decision of an umpire selected by them.

3.—The voluntary submission to a regional adjustment conference carries with it an agreement by both parties that there shall be no interference with production pending the processes of adjustment.

4.—If the parties, or either of them, refuse voluntarily to submit the dispute to the processes of the plan of adjustment, a regional board of inquiry is formed by the regional chairman, of two employers and two employes from the industry, and not parties to the dispute. This board has the right, under proper safeguards, to subpoena witnesses and records, and the duty to publish its findings as a guide to public opinion. Either of the parties at conflict may join the board of inquiry on giving an undertaking that, so far as its side is concerned, it will agree to submit its contention to a regional adjustment conference, and, if both join, a regional adjustment conference is automatically created.

5.—The national industrial board in Washington has general oversight of the working of the plan.

6.—The plan is applicable also to public utilities, but in such cases, the government agency, having power to regulate the service, has two representatives in the adjustment conference. Provision is made for prompt report of its findings to the rate regulating body.

The conference makes no recommendation of a plan to cover steam railroads and other carriers, for which legislation has recently been enacted by congress.

7.—The plan provides machinery for prompt and fair adjustment of wages and working conditions of government employes. It is especially necessary for this class of employes, who should not be permitted to strike.

8.—The plan involves no penalties other than those imposed by public opinion. It does not impose compulsory arbitration. It does not deny the right to strike. It does not submit to arbitration the policy of the "closed" or "open" shop.

The plan is national in scope and operation, yet it is decentralized. It is different from anything in operation elsewhere. It is based upon American experience and is designed to meet American conditions. It employs no legal authority except the right of inquiry. Its basic idea is stimulation to settlement of differences by the parties in conflict, and the enlistment of public opinion toward enforcing that method of settlement.

II—PREVENTION OF DISPUTES

Joint Organization Through Employe Representation

Prevention of disputes is worth more than cure. The conference feels that a new basis of industrial peace may be found in the further development of the democratic organization of the relations of employers and employes, now widely in progress through the country.

Modern industry, as conducted in large plants, has caused a loss of personal contact between employers and employes. It has also caused, through high specialization and repetitive mechanical processes, a loss of creative interest. But it makes possible a greater production of the material things which contribute to the common resources of the people. Upon these resources and advancing civilization, with a higher common standard of living, must depend.

Direct personal contact in the old manner cannot be restored. It is necessary, therefore, to find the best possible substitute through democratic representation. Employes need an established channel of expression and an opportunity for responsible consultation on matters which affect them in their relations with their employers and their work. There must be diffused among them a better knowledge of the industry as a whole and of their own relation to its success. Employe representation will

not only enable them better to advance their own interests, but will make them more definitely conscious of their own contribution, and their own responsibilities.

Employe representation has been discussed under different names and forms, such as shop committees, shop councils, works councils, representative government in industry and others. But representation is a definite principle rather than a form. The conference, therefore, prefers the generic term "employe representation." In using this term the conference has in mind the successful application of the principle to various activities outside, as well as within, the purely industrial field.

From both employers and employes the conference has received thoughtful and helpful suggestions as to the possibilities, under proper conditions, of employe representation. These suggestions clearly proceed from a genuine desire that this movement may spread in accordance with sound principles and be kept from perversions which would threaten its lasting usefulness by making it an agency of attack rather than a means to peace.

Employe representation organizes the relations of employer and employe so that they regularly come together to deal with their common interests. It is operating successfully under union agreements in organized shops. It is operating in nonunion shops, and it is operating in shops where union and nonunion men work side by side. In plants working under union agreement, it adds to collective bargaining an agency of cooperation within the plant. It is itself an agency of collective bargaining and co-operation where union agreements do not obtain.

It is idle wholly to deny the existence of conflicting interests between employers and employes. But there are wide areas of activity in which their interests coincide. It is the part of statesmanship to organize identity of interest where it exists in order to reduce the area of conflict. The representative principle is needed to make effective the employe's interest in production, as well as in wages and working conditions. It is likewise needed to make more effective the employer's interest in the human element of industry.

The idea of employe representation has aroused opposition from two sources. On the one hand, in plants too large for direct personal contact, employers who still adhere to the theory that labor is a commodity, hold off from any form of co-operation with employes. This view is steadily disappearing and will, it is hoped, wholly disappear. On the other hand, a number of trade union leaders regard shop representation as a subtle weapon directed against the union. This thought is apparently based on the fear that it may be used by some employers to undermine the unions. Conceived in that spirit no plan can be a lasting agency of industrial peace.

But occasional misuse of employe representation and the consequent hesitancy of organized labor to endorse it officially, are based on a misconception of the possible and desirable relations between the union and the shop committee. This relation is a complimentary, and not a mutually exclusive one. In many plants the trade union and the shop committee are both functioning harmoniously. In some establishments the men are unionized, and the shop committees are composed of union men. In others, some men belong to the trade union while all belong to the shop organization.

The union has had its greatest success in dealing with basic working conditions, and with the general level of wages in organized and partially organized industries and crafts. It has also indirectly exerted an influence on standards in unorganized trades. There is no reason to suppose that in the future this influence will not continue.

Local problems, however, fall naturally within the province of shop committees. No organization covering the whole trade and unfamiliar with special local conditions and the questions that come up from day to day, is by itself in a position to deal with these questions adequately, or to enlist the co-operation of employer and employe in methods to improve production and to reduce strain. Except for trades in which the union itself has operated under a system of employe representation, as it does in shipbuilding and in the manufacture of clothing and in other trades, these internal factors are likely either to be neglected or to be dealt with in a way which does not make for satisfactory co-operation.

The existence of employe representation in plants operating under union agreement does not necessarily reduce the scope of the union representative's work. But matters are more likely to come to him as questions of the application of an agreement rather than as mere grievances. In other words he has greater opportunity for service in negotiation of an essentially conciliatory nature. The fortunate results of such development have been evident in industries in which employe representation and trade unions have for some time been functioning harmoniously.

Employe representation must not be considered solely as a device for settling grievances. It can find success only if it also embodies co-operation in the problem of production. Whatever subjects the representatives come to feel as having a relation to their work, and their effectiveness as members of the plant, may come within the field of committee consideration. It is a thing to be undertaken, if at all, in a thoroughgoing way. Representatives must be selected by the employes with absolute freedom. In order to prevent suspicion on any side, selection should be by secret ballot. There must be equal freedom of expression thereafter. All employes must feel absolutely convinced that the management will not discriminate against them in any way because of any activities in connection with shop committees. Meetings should be held frequently and regularly, not merely when specific disputes are threatened. Both sides must be prepared to study the problems presented and must give them patient, serious and open-minded consideration. There should be made available those facilities and facts essential to the formation of soundly based conclusions.

Employe representation offers no royal road to industrial peace. No employer should suppose that merely by installing some system of shop representation he can be assured, without continued effort, of harmony and increased production. Doubtless there will be failures where the plan is adopted as a fad or a panacea. It is only a means whereby sincerity of purpose, frank dealing and the establishment of common interests, may bring mutual advantage.

The development and maintenance of right relations between employer and employe require more than mere organization. Intelligent and wise administration is needed of all those problems of production that directly touch the employe. Conditions affecting human beings in industry were, during the last generation, largely in charge of men whose special training had been devoted to the mechanical side of production. Much study was given to the machinery and processes upon which men worked. But the factors that contribute to the broader human development and satisfaction of the employe and that lead to increased productivity were too nearly neglected. The elimination of human friction is, even from the point of view of increased production, at least no less important than the elimination of waste in materials, or in mechanical power.

Establishments in which the ultimate management is of necessity widely removed from the employes, require provision for specialized study of industrial relations. But the right concept of human relations in industry, which should be the primary impulse of management, is of full value only when it permeates the entire administrative force. Farsighted executives testify to the advantage gained from careful and painstaking efforts to encourage and educate their foremen in the proper attitude toward employes.

A large proportion of men trained in our engineering and technical schools now pass into executive positions. It is, therefore, desirable that these schools should provide courses of instruction in which the psychological and industrial background for human relations work shall be developed. But no amount of education outside the plant will remove the need for the systematic training of the force within.

Some industries have extended the principles of employe representation beyond the individual plant. The voluntary joint councils, which have thus been set up in the clothing industry, in the printing trade, and elsewhere are fruitful experiments in industrial organization.

The conference has had the benefit of testimony from both employers and employes who have had experience of the results of employe representation. An enthusiasm has been shown which comes from a sincere feeling of substantial progress in the development of human relations.

(To be Continued.)

Price Advances

Announced in Benzol and Toluol in Drums—Supplies Are Easier

New York, March 22.—As recently predicted in the trade, prices on benzol and toluol in drums have been advanced. Ninety per cent benzol, for spot and contract delivery, now is quoted at 27½ to 30½ cents, and pure benzol at 29½ to 32½ cents, f.o.b. producers' plants. In tank cars, the old prices prevail, 25 cents being quoted for 90 per cent, and 27 cents for pure. Toluol in drums now is holding at 30½ to 33½ cents and in tank cars at 28 cents.

Benzol is in good demand, although supplies as a whole are somewhat easier than a month or so ago, when production was at a lower ebb, and congestion on the railroads was more pronounced.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.29½ to .32½
Toluol	.30½ to .33½
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.08 to .09
Naphthalene, balls	0.09½ to .10½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$4.50 to $4.60

Contract

Pure benzol	$0.29½ to .32½
Toluol	.30½ to .33½
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.07 to .08
Naphthalene, balls	0.09½ to .10½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

In toluol, the situation also is somewhat easier, and this appears to be due in part to a slight falling off in activity. Spot supplies are rather plentiful. The market on solvent naphtha remains strong and an advance is expected soon Spot and contract material is being quoted at 22 to 27 cents. One of the leading sellers remains out of the market.

The drug trade and dye interests continue to demand for naphthalene heavily, and at the present time there are few supplies of either flakes or balls for spot shipment. One of the leading sellers is not quoting balls at this time. Phenol continues featureless, government supplies still going at 12 cents, warehouse.

Fertilizer interests now are commencing to come into the sulphate of ammonia market, and substantial contracts are likely to be consummated shortly. So far, however, no business of consequence has been booked, and inquiry for spot shipment is light. This is due in large measure to the fact that there is little, if any, spot material available. Foreign inquiry, for this reason in particular, has slumped off considerably. A nominal market on spot shipment for domestic account of $4.50 to $4.60 f.o.b. producers' plants prevails. Export deliveries several months hence are quoted at $7 to $7.35.

News of Societies

Topics Discussed at Meetings of National and Local Trade and Technical Organizations

RENEWED enthusiasm, after several years of federal control, was the result achieved by the meeting of the National Railway Appliance association and the American Railway Engineering association and their allied organizations, held at Chicago, last week.

Sessions of engineering societies were fully attended and great interest was manifested in the various subjects discussed, relating to almost every branch of railroad activity. In spite of the large number at these sessions, the exhibit in the Coliseum was crowded throughout the four days it was open.

One of the interesting exhibits was that of the American Malleable Castings association. It presented a large variety of malleable iron castings, many of which had been subjected to unusual tests and had been beaten out of shape without breaking.

The Bethlehem Steel Co. showed its line of switch stands and steel rail, and the Lackawanna Steel Co. showed a large variety of steel rail sections, including some of the largest rail ever rolled. The Cambria Steel Co. centered its efforts on steel axles and to show their strength and resistance to fracture, displayed bent and twisted axles. The Jones & Laughlin Steel Co. devoted its booth to reception purposes. The National Malleable Casting Co. exhibited tie plates and rail braces, while the Chicago Malleable Castings Co. devoted its entire space to cast tie plates.

The Armco Iron Culvert & Flume Manufacturers' association had an interesting exhibit of corrugated iron culverts and similar devices. The Graver Corp., formerly the William Graver Tank Works, exhibited steel tanks and water softeners. The Blaw-Knox Co. had working models of grab buckets and similar equipment. The Chicago Penumatic Tool Co. had an air compressor at work in its large exhibit of pneumatic tools. The American Steel & Wire Co. exhibited various sorts of wire and wire fences with posts and braces.

Several manufacturers showed various types of gasoline cars for section workers and for inspection. Among these were Mudge & Co., Fairbanks, Morse & Co., the Buda Co., and the Kalamazoo Railway Supply Co. In addition to these devices to run on tracks, there were exhibits of electric and gasoline tractors for use in freight houses and elsewhere, including the trackless train of the Mercury Mfg. Co. and various truck devices by the W. F. Hebard Co., Chicago. The Kelly-Derby Co. showed a number of hand-operated trucks for construction and other work. An interesting exhibit was that of the General Electric Co., in which arc welders were at work under the eye of the observer.

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Definite plans have now been made for the meeting of the Electric Furnace association in Boston, April 8 and 9. The business meeting and election of officers will be held at the Copley-Plaza hotel at 1 p. m. on Thursday, April 8, and will be combined with a luncheon. At 2 p. m. a general meeting will be held, which will be open to all who are interested in the electric furnace industry. The subject, "Adequately Trained Men—An Urgent Need of the Electric Furnace Industry," will be discussed. Papers have been prepared by makers of furnaces and equipment and by electric steel manufacturers. Representatives of a number of engineering institutions will also discuss what they are doing to train men for metallurgical work. On Friday, April 9, the association will join with the American Institute of Electrical Engineers and the American Electro Chemical society in discussions on "Electrically Produced Alloys" and "Power or Electrochemical Purposes." In the afternoon an inspection trip to the plant of the General Electric Co., Lynn, will be made.

Obituaries

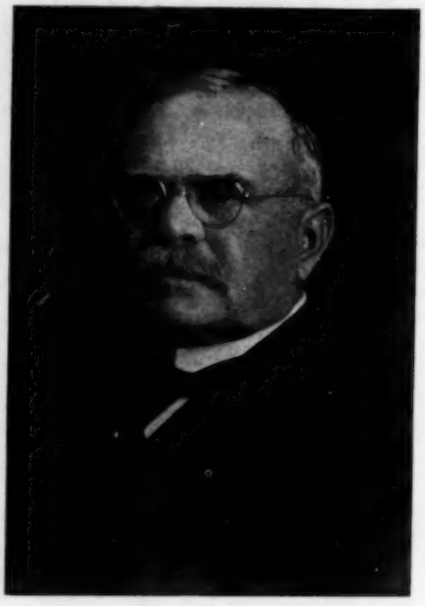
FREDERICK E. GORDON, president of the Gordon Sand Co., Inc., owner and operator of the Ohio Sand Co., Conneaut, O., miner and shipper of all grades of molding sand, died at his home in Conneaut, March 12. Born in Cleveland, July 10, 1856, he early obtained a position on *The Cleveland Herald*, a daily newspaper. As a young man he became connected with the Taylor & Boggis Foundry Co., and became superintendent of its No. 2 plant in that city He was with that company for about 17 years and left in March, 1890, to become superintendent of the Fuel, Gas & Electric Engineering Co., Pittsburgh, which later was taken over by the Westinghouse Electric & Mfg. Co. Mr. Gordon filled the position of foundry superintendent for about three years during which time he became interested in sand holdings near Conneaut. He finally went to Conneaut in March, 1893, forming the Ohio Sand Co., of which he became president and manager. Of an investigating turn of mind, Mr. Gordon conducted a series of experiments in the production of facings for fine, light castings and was remarkably successful. When the Interstate Sand Co. was formed at Cleveland, he became its vice president. The Ohio Sand Co. later was merged into the Gordon Sand Co., of which Mr. Gordon was elected president, in which position he remained until his death. He also was president of the Citizens Banking & Trust Co., Conneaut.

The following is an appreciation of Mr. Gordon, written by Benjamin D. Fuller, who is vice president and manager of the interests controlled by W. D. Uptegraff, Pittsburgh, and former president of the American Foundrymen's association:

In the death of Fred E. Gordon, president of the Gordon Sand Co., Conneaut, O., there has passed one whose name and face were familiar to many hundreds of foundrymen, particularly the foundrymen of the middle section of the country. Mr. Gordon, by reason of his genial manner and wholesome energy, ever was a welcome visitor, and who by constant personal supervision was enabled to realize ideals in business, inspiring confidence and gaining for himself steadfast friends. As a producer of molding sand, he soon became a recognized leader in the business. Mr. Gordon will be missed, not only by business associates but by the many friends who have enjoyed the hospitality of his fine home in Conneaut and by members of the American Foundrymen's association, of which body he was an active member and whose annual meetings he attended regularly.

Adam Hall, a prominent manufacturer of Peterborough, Ont., aged 74, died on March 14. He began business in a small way in 1878 and afterwards established the company of Adam Hall, Ltd., stove manufacturer.

Philip H. Seaver, for 31 years associated with the London Iron Works, Rutland, Vt., much of the time as



FREDERICK E. GORDON

secretary and treasurer, died at his home in that city, March 17, after a long illness, aged 71 years.

Orange Jull, of Toronto, Ont., died on March 14 at the age of 75. He was the inventor of the two mechanical snow plows used on railways in Canada and the United States. Most of his life was spent in Orangeville, Ont., but for the last 17 years he had been a resident of Toronto.

J. C. Scott, manager of the tool steel department of the Bourne-Fuller Co., Cleveland, died Sunday, March 21, after an illness of about a month. Mr. Scott was head of the tool steel department for many years and was with the Bourne-Fuller Co. for about 35 years.

Joseph R. Beatty, for the past 18 years Boston manager for the Fairbanks Co., died recently at his home in Newtonville, Mass., aged 57 years. His connection with the Fairbanks Co. started in 1896 in Philadelphia, where he was born.

Charles Haffner, president of the Charles Haffner Co., 2246 South Halsted street, Chicago, boiler manufacturer, died March 16 of heart disease, aged 77 years. He was born in Wuerttemberg, Germany, in 1843, coming to America in 1859 and settled in Chicago in 1862. In 1883 he founded the boiler business.

Robert S. Armstrong, president of Robert S. Armstrong & Bro., Atlanta, Ga., one of the largest companies in the South dealing in iron and heavy machinery, died suddenly at his home in Atlanta on March 12. Mr. Armstrong was the founder of the company of which he was the executive head, organizing the business in 1886.

Nicholas Howard Easton, president of the Easton & Burnham Machine Co., Pawtucket, R. I., died of apoplexy in an automobile March 14. He was interested in a number of other Pawtucket industries, being president of the Pawtucket Mfg. Co., maker of bolts, nuts and special machinery, and a director of the Fales & Jenks Machine Co., besides being a director of several textile companies. Mr. Easton was 63 years of age.

Melvin B. Newcomb, aged 31, chief engineer of the rubber machinery department of the Wellman-Seaver-Morgan Co., Cleveland and Akron, O., died March 13, after a short illness at his home in the latter city. Mr. Newcomb was born in 1889 in Bridgeton, N. J. He received his mechanical engineering education at the University of Wisconsin. He has been engaged in engineering work with the I. P. Morris Co., Philadelphia, the Allis-Chalmers Mfg. Co., Milwaukee, the Wisconsin Engine Co., Corlis, Wis., and the Firestone Tire and Rubber Co., Akron, O. In January, 1918, he joined the hydraulic turbine engineering department of the Wellman company. A few months later he was appointed chief engineer of its rubber machinery department. Mr. Newcomb was a member of the American Society of Mechanical Engineers, the Cleveland Engineering society, and the Akron Engineering society.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

GEORGE P. SPEAR, for the past seven years assistant general manager of the Corbin Screw Corp., a subsidiary of the American Hardware Corp., New Britain, Conn., has been promoted to general manager to succeed Charles Glover. Mr. Glover, who is first vice president of the corporation, has been designated mechanical and engineering director. Lauren M. Bancroft, who has been with the corporation in two branches, for 30 years, has been promoted to office manager of the Corbin Screw division.

D. C. Selheimer, formerly of Packard Motor Car Co., Detroit, has assumed duties as works manager of the Lafayette Motors Co., Indianapolis.

Prof. Arthur D. Butterfield has resigned from the faculty of the Worcester Polytechnic institute, Worcester, Mass., to become educational director of the Norton Co. of that city, an office newly created.

Robert Daily has been elected treasurer, W. B. Mertens is chief engineer and Frank Jarvis, purchasing agent of the Friend Motors Co., Pontiac, Mich., formerly the Olympian Motors Co.

Philip H. Praher of the United Shoe Machinery Corp., and William F. Fitzgerald, president of the Turner Tanning Machinery Co., both of Boston, have been elected directors of the New England Shoe & Leather association.

William T. Lancaster, who recently became sales manager of the Electric Brazing & Welding Machine Co., Inc., 30 Church street, New York, was presented with a diamond-studded Masonic watch fob by the employes of the Waclark Wire Co., Bayway, N. J., when he resigned as its general superintendent.

Victor T. Noonan, director of safety at the Fore River yard of the Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass., and G. E. Sanford, of the General Electric Co., Lynn, Mass., have been elected president and vice president respectively of the Boston council, National Safety council.

Wesley Frost has been assigned to take charge of the office of foreign trade adviser in the state department, Washington, until further orders with the designation of acting foreign trade adviser. Mr. Frost succeeds Julis G. Lay.

S. F. Wall and T. M. Olson, secretary and treasurer and manager, respectively, of the Michigan Tool Co., Detroit, have resigned to give their entire attention to the Continental Tool Works, that city, recently organized by them.

Albert B. Allen, treasurer of the American Tap & Die Corp., Greenfield, Mass., has been elected president to succeed Walter E. Nichols, who has disposed of his interest to Mr. Allen and retired. Mr. Nichols, who has been in business more than 30 years, will take a well earned rest.

Burton H. Gedge Jr., has been chosen as superintendent of the rolling mills at the Cuyahoga works of the American Steel & Wire Co., Cleveland. Mr. Gedge will supervise the operation of four mills, after having been employed in rolling mills about seven years.

A. H. Eddy, founder of the Eddy Electric Co., Windsor, Conn., maker of motors and generators, now owned and operated by the General Electric Co. and later a builder of refrigerating machines, has disposed of his business to Henry S. Loomis, who will continue it, specializing in electrical appliances.

J. D. W. Snowden, general representative of the American Steel Export Co.'s Brazilian corporation, has arrived in New York for a conference regarding plans and scope of future operations in Brazil. During his absence the Rio Janeiro office will be in charge of A. E. Hofus of the home office engineering department.

W. H. Genske of Milwaukee has been elected secretary and treasurer of the Davis-Hansen Pump Co., Oshkosh, Wis. He takes the place of Walter T. Grundy, treasurer, and Robert Wertsch, secretary. They, with R. A. Phelps, sales manager, resigned March 1 to form the Domestic Utility Supply Co. of Oshkosh.

Henry A. Brown has severed his connection with the Rochester, N. Y., office of the Brown & Sharpe Mfg. Co., Providence, R. I., and has been elected vice president in charge of engineering and sales of A. C. Towne, Inc., Buffalo, small tool specialists and district representative of the Illinois Tool Works. Mr. Brown formerly was captain in the ordnance department in charge of manufacturing operations in the armory of the Rock Island arsenal.

A. A. Shafer has been appointed secretary and general manager of the Rickert-Shafer Co., 613 West Eleventh street, Erie, Pa., manufacturer of automatic tapping machines, automatic die heads, etc. C. W. Howard, formerly with the General Electric Co., has been made its general sales manager, while A. J. Patterson, formerly with the Crucible Steel Co., now is general superintendent. George Patterson recently became production manager.

G. E. Warren has resigned as assistant manager of the service bureau of the Universal Portland Cement Co., Chicago, effective April 1, to continue his duties as manager of the American Concrete Pipe association. He has been with the service bureau of the Universal company for about five years. During the past year, he also has served as secretary and treasurer of the concrete pipe association. J. W. Lowell, who has been eastern manager of the Universal company's service bureau, will succeed Mr. Warren as assistant manager at Chicago on April 1.

Walter H. Hart was elected a director of the Stanley Works, New Britain, Conn., recently to fill the vacancy caused by the death of his father, William H. Hart, for many years president of the corporation. The vacancy caused by the death of L. Hoyt Pease was not filled. These directors were elected: Chairman, George P. Hart, E. Allen Moore, F. G. Platt, Edward N. Stanley, Frederick S. Chamberlain, A. W. Stanley and Walter H. Hart. They organized by the election of the following officers: President, E. Allen Moore; first vice president, Clarence F. Bennett; second vice president, Walter H. Hart; treasurer, Louis W. Young; secretary, Ernest W. Christ; assistant secretary, P. F. King.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

E. L. IVES has resigned his position with the Steel & Tube Co. of America to become associated with Brassert, Hardy & Tripp, Chicago, owners of the Miami Metals Co. and other iron and steel interests. He will assist Mr. Brassert in reporting and consulting work in the iron and steel industry. He is a graduate of Yale and started his career with the Newport News Shipbuilding & Drydock Co. In 1906 he entered the employ of the Illinois Steel Co., at South Chicago and was assistant superintendent of blast furnaces until 1912 when he was made manager of the Iroquois Iron Co.'s plants at South Chicago.

W. W. Hearne, resident partner of the Matthew Addy Co., Philadelphia, is about to leave on a trip to Europe.

Jay C. McLauchlan of Pickands, Mather & Co., Cleveland, has returned after a six weeks' stay in California.

C. E. Pipp has been re-elected president of the Angle Steel Co., Otsego, Mich.

Robert B. Linden has become affiliated with the Smiley Steel Co., Inc., 115 Broadway, New York, as sales manager, having resigned his position with the Alliance Iron & Steel Corp.

K. Kennedy, a mechanic with a wide experience, has established a pattern shop at Anniston, Ala., which will be devoted exclusively to the making of patterns for the various pipe plants and foundries in that city.

Fred Hubler resigned recently as cost clerk in the auditing department of the Youngstown Sheet & Tube Co., Youngstown, O., to become general auditor of the Youngstown Steel Car Co., that city.

C. C. Boyden, formerly associated with B. Nicoll & Co., New York City, now is connected with the sales department of the Alan Wood Iron & Steel Co., Widener building, Philadelphia.

Henry Payne, for some time metallurgist with the National Malleable Castings Co., has been transferred from Sharon, Pa., to its Cleveland works. He will have charge of special research work, taking up his new duties about April 1.

B. A. Greene, formerly connected with the Carnegie Steel Co., and the National Tube Co., now is engaged in business at Detroit, with headquarters at 401 Old Whitney building, conducting a steel sales agency as B. A. Greene & Co.

John McKay, for 12 years superintendent of the Greenville, Pa., plant of the Carnegie Steel Co., has been made assistant superintendent of the McDonald, O., mills of the same corporation, succeeding Clarence A. Miller who has been made superintendent.

John D. Rockefeller Jr., resigned as a director of the Colorado Fuel & Iron Co., Denver, at the annual meeting held March 15, after serving on the board for 17 years. He is succeeded by John C. Mitchell, a Denver banker.

W. L. Cromlish has been appointed coal freight agent of the Baltimore & Ohio railroad in Pittsburgh in charge of the Connellsville and Pittsburgh divisions, the New Castle division, Warren, Pa., and east thereof, and the Wheeling division from Moundsville to Wheeling, inclusive.

F. S. Carr, vice president of the Pennsylvania Steel Export Co., Philadelphia, has returned to this country, after a six week's trip in England. S. C. Halford, manager of that company's London office, returned with Mr. Carr, for a brief stay in this country.

Gen. Samuel McRoberts, who recently resigned as chairman of the board and as executive manager of the National City Co., Cleveland, has become a director of the West Virginia Metal Products Corp., Fairmount, W. Va., recently organized by Cleveland interests to manufacture brass and copper sheets.

Edmund S. Morris, who has been affiliated with the Bayonne Bolt & Nut Co., Bayonne, N. J., as secretary and assistant treasurer for 12 years, resigned recently to become treasurer of the L. C. Harry Co., 114-118 Liberty street, New York City, heavy hardware and contractors' supplies. He also is first vice president of the Cortada & Morris Co., Havana, Cuba, handling hardware and contractor's equipment.

Jonathan Warner, president of the Trumbull Steel Co., Warren, O., has resigned as president and trustee of the Youngstown, O., Y. M. C. A., which position he has held for the past four years.

Herbert N. Shenton has been appointed acting director of the council of national defense, to succeed Grosvenor B. Clarkson, who recently resigned. Mr. Shenton has been head of the council's research staff.

Maj. Walter Alexander, Milwaukee, Wis., for the past year chief mechanical engineer of the Wisconsin state highway commission, has resigned, effective March 1, to accept the position of vice president and general manager of the Union Refrigerator Transit Co., Milwaukee.

C. H. Martin and Gustav Schirmer have been transferred to the Pittsburgh and Detroit offices, respectively, of the Whiting Foundry Equipment Co., Harvey, Ill., to assume the duties of sales engineers. Both men have spent several years in the estimating and sales departments at the company's main office.

H. D. McKnight, for some time connected with the traffic department of the Brier Hill Steel Co., Youngstown, O., has been made traffic manager of the Newton Steel Co., Newton Falls, O. In 1898 Mr. McKnight was traffic manager of the United States shipping board in the Cleveland district.

John W. Norcross, of Montreal, who has been elected a director of the Dominion Steel Corp., has been prominently identified with the shipbuilding, transportation and allied interests of Canada. He became managing director of Canada Steamship Lines, Ltd., in 1913, of which he now is president. Mr. Norcross is also president of Halifax Shipyards, Ltd.; vice president of the Collingwood Shipbuilding Co., and director of Canadian Vickers, Ltd., Chase Motors, Ltd., the Sterling Bank of Canada and several other corporations.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

RAY T. MIDDLETON has resigned as general sales manager of the Standard Steel Castings Co., Cleveland, to become vice president and director of sales and advertising for the Kelly Metals Co., Chicago, Detroit and Los Angeles. Mr. Middleton's headquarters will be Chicago, where the Kelly company, at an early date, will establish its principal production plant. The company will continue its present plants in Detroit and Los Angeles and later establish a third branch plant, at a point to be selected in the east.

Charles F. Uebelacher has been appointed assistant to the president of the Maxwell-Chalmers Motor Co., Detroit.

H. B. Dineen has been appointed trade manager of the Moline Plow Co., Moline, Ill. He went with the Moline Plow Co. last fall as assistant production manager. He formerly was assistant trade manager and manager of the plow works of Deere & Co.

O. H. Peters resigned as general superintendent of the Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of engines, machinery, etc., to become general manager of Clark Bros. & Co., Olean, N. Y., manufacturers of saw mill machinery.

J. Brooks Nichols, George A. Du Charme, E. E. McNair, Henry T. Cole, Charles C. Jenks, Sidney T. Miller, M. T. Murphy and Lewis H. Paddock, all of Detroit, are among the newly elected directors of the United States Radiator Corp., Dunkirk, N. Y.

Ernest R. Burwell, at one time a director of the New Departure Mfg. Co., Bristol, Conn., has been elected president and treasurer of the Bristol Mfg. Co., of that city, to fill the vacancy caused by the recent death of Arthur D. Hawley.

E. E. Yake now is affiliated with the Walworth Mfg. Co., Boston, having resigned his position with the Gilbert & Barker Mfg. Co., Springfield, Mass., manufacturer of furnaces, fuel oil equipment, etc., where he had charge of the engineering department.

J. F. Cox, formerly president and general manager of the E. T. Burrowes Co., Portland, Me., has joined the coaster brake department of the New Departure Mfg. Co., Bristol, Conn. He was at one time purchasing agent of the Pope Mfg. Co., Hartford, Conn.

L. R. Meisenhelter who has disposed of his interest in the L. R. Meisenhelter Machinery Co., has been appointed special representative of the Houston, Stanwood & Gamble Co., Cincinnati, manufacturer of large lathes. He will devote his entire time to the sale of this company's product.

James K. Van Canpen Jr., formerly assistant chief engineer of the Camden Forge Co., Camden, N. J., recently was appointed Pittsburgh district manager for that company succeeding J. H. Shuler, resigned. The company's Pittsburgh office is located at 984 Union Arcade building.

F. R. Field has been placed in charge of the recently established branch office in Los Angeles by the Jeffrey Mfg. Co., Columbus, O., elevating, conveying, crushing and mining machinery. Mr. Field, formerly was in charge of the company's branch office in Denver.

Richard G. Wood, chairman of the board of the Alan Wood Iron and Steel Co., Philadelphia, is at Palm Beach, Fla., where he plans to remain until about April 1. Jonathan R. Jones, vice chairman of the board of the Alan Wood company, has left for a trip of about two months at Miami, Fla., and other southern points.

Lawrence J. O'Laughlin, formerly connected with the engineering department of the Cambria Steel Co., Johnstown, Pa., but now associated with Perin & Marshall, Rector street, New York, consulting engineers, left from San Francisco, recently, for Pekin, China, where he will join Stewart M. Marshall in an inspection of the Chinese steel plants being erected by his company.

Sidney S. Parker, who recently resigned his position as manager of the crucible and electric furnaces and tool steel department of Messrs. Vickers River Don works, has joined the board of Messrs. John Nicholson & Sons, Ltd., Sheffield, England, one of the oldest established steel firms in the Sheffield district. Mr. Parker is said to have had charge of the first commercial electric furnace installed in the British Isles.

Barton R. Shover, consulting engineer, Pittsburgh, was the speaker at February meeting of the Engineers' club of Youngstown, O., Tuesday evening, Feb. 24. Mr. Shover, who designed and supervised the construction of the steel plant of the Tata Iron & Steel Co. of India, spoke on "Making Steel in India." He served as general manager of that plant for two years, having previously been connected with the Carnegie Steel Co. Lately he has done much work for the Dominion Iron & Steel Co. in Nova Scotia and is the consulting engineer of the recently organized Electric Alloy Steel Co. of Youngstown.

Dudley Docker, who has had much to do with bringing about the prosperous condition of the Metropolitan Carriage, Wagon & Finance Co., Birmingham, Eng., was presented with an illuminated address bearing 1100 signatures together with a sum of money for the creation of a Docker scholarship at the Birmingham university, for employes of the Metropolitan company. The occasion for the presentation at the Savoy hotel, London, Jan. 22, was the recent amalgamation of the Metropolitan company with Vickers, Ltd. Shareholders took this method of showing their appreciation of Mr. Docker's services during the past 17 years, during which he has expended his efforts to bring about an amalgamation of the various works for the building of rolling stock. In 1902 the Metropolitan company was merged with the Ashbury Co., the Brown Marshall Co., the Lancaster Co., and in 1906 it took in the Oldbury Railway Carriage & Wagon Co. Subsequently a large iron and steel works at Wednesbury, the Patent Shaft & Axletree Co. was absorbed. During the past few years, Mr. Docker has achieved international fame through the large part he played in the development of the Federation of British industry and in recognition of his national services distinction of C. B.

Present Machinery Trade Small

Inquiries as Well as Orders of Size Are Lacking—Inquiries for One or Two Tools Come from Scattered Sources — Crane Inquiry Shows Slight Increase in the East — Orders Are Few

REPORTS from the different machine tool and equipment market centers of the country for the past week, indicate slightly contrasting conditions. In the east, few inquiries are current and not many orders are being placed while in the west, inquiries, though small are fairly numerous and orders are in keeping. As a rule however, sizable inquiries as well as orders, are lacking in all sections.

Perhaps the largest order closed recently in the east was taken from the Lord Construction Co., New York City, for machine tools for its Weehawken, N. J., shop. The Cleveland Twist Drill Co., Cleveland, bought several lathes in that city and is expected to close on 10 more soon. Other prospective business of size is scheduled to be placed at an early date by the American Locomotive Co., Otis Elevator Co., Federal Shipbuilding Co., Lehigh Valley and New York Central railroads, and the General Electric Co., which has purchased the Remington Arms Co. plant in Bridgeport, Conn., in the east; the Wellman-Seaver-Morgan Co., Akron, O., in Cleveland; The Sherbrooke Iron Works, Sherbrooke, Que., purchased by New York City interests, in Canada; and in the west by the Portland Stove Works, Portland, Oreg.

In Pittsburgh the demand for machine tools continues to be characterized as "good" although a shortage of motors is becoming a factor, manufacturers claiming to be filled up with orders for motors for household electrical appliances to the detriment of the machine tool trade. A shortage of castings is beginning to be felt in the Chicago market. Machine tool manufacturers there are handicapped in their effort to supply the market because they cannot get castings in sufficient quantity due to labor shortage.

Crane inquiries are slightly on the increase in the east, while the demand in the west measures up to what it has been for several weeks. The Pittsburgh Plate Glass Co., Pittsburgh, is expected to close shortly on cranes desired for its Ford City, Pa., and Kokomo, Ind., plants. The Miami Copper Co., New York, has issued an inquiry for three cranes for Arizona, while the Cambria Steel Co., Johnstown, Pa., wants three 10-ton units in addition to a like number of 20-ton cranes asked for recently. Boland & Co., Troy, N. Y., wants two; the Worthington Pump & Machinery Co., East Cambridge, Mass., desires one crane, one trolley and one auxiliary, while the Trayler Engineering Co., Allentown, Pa., and the Standard Oil Co., Charleston, S. C., Lutz Co., Philadelphia, Bergen Point Iron Works, Bayonne, N. J., A. B. Farquhar Co., Ltd., York, Pa., each want one. The American Brake Shoe & Foundry Co., Newark, N. J., is expected to issue a crane list soon. Three special and one standard cranes were bought by the Seaboard Steel Co., Newcastle, Del., recently, and it is understood, will close on more soon.

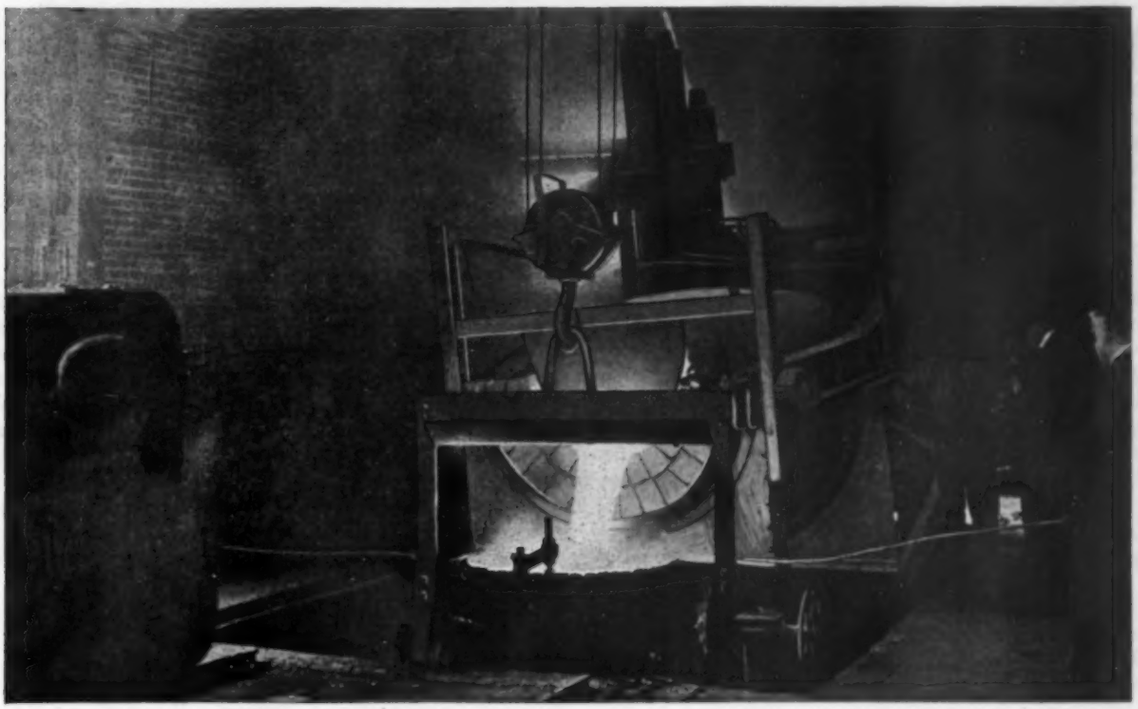
Machine Trade Quiet; Crane Inquiries Increase

WHILE small inquiries are fairly plentiful, the eastern machine tool market on the whole is quiet. Not only are sizable inquiries lacking, but also sizable orders. There are, however, a few good-sized lists which may be placed any time. These include inquiries from the American Locomotive Co., the Otis Elevator Co., the Federal Shipbuilding Co., and the Lehigh Valley and New York Central railroads.

Among the foremost buyers during the past few days has been the Lord Construction Co., 105 West Fortieth street, New York City, which has closed on a fair sized list of small machine tools for its proposed machine shop at Weehawken, N. J. Of interest to the trade is the announcement that the General Electric Co. has taken over the direct operation of the Remington Arms plant in Bridgeport, Conn. The company will likely build small motors, and it appears to be the belief that no great amount of new equipment will be required.

New crane inquiries appear slightly more plentiful. One of the larger of these calls for one 25-ton crane, with 36-foot span, one 15-ton crane, with 36-foot span, and one 1-ton crane, with 28-foot span, for the Miami Copper Co., 61 Broadway, New York City. The cranes are for shipment to Arizona. The Cambria Steel Co., Johnstown, Pa., is inquiring, in addition to three 20-ton cranes, for three 10-ton cranes, with 30-foot span. The Standard Oil Co. is in the market for a 5-ton handpower crane for Charleston, S. C. Boland & Co., Troy, N. Y., are asking bids on one 10-ton crane with 40-foot span, and one 2-ton crane, also with 40-foot span. The Traylor Engineering Co., Allentown, Pa., is inquiring for estimating figures on a 30-ton overhead crane, and the Worthington Pump & Machinery Co., East Cambridge, Mass., is inquiring for a 7½-ton standard crane, one 15-ton trolley, and one 5-ton auxiliary. Another recent inquiry is that of the Lutz Co., Philadelphia, calling for one 10-ton electric crane with 40-foot span. The Bergen Point Iron Works, Bayonne, N. J., is inquiring for a 5-ton crane with 47-foot span. A. B. Farquhar Co., Ltd., York, Pa., is inquiring for a 3-ton electric crane, with 30-foot span.

Recent orders include three special cranes and one standard



Teeming One of Our Electric Crucible Furnaces

ESTABLISHED LUDLUM 1854

Do you realize that the majority of twist drill and milling cutter manufacturers in America are using Ludlum Steels?

Ludlum "Consistently Uniform" Brands:

MOHAWK EXTRA — High Speed Steel
POMPTON — Carbon Tool Steel
ALBANY — Alloy Tool Steel
ONEIDA — Oil Hardening Tool Steel
HURON — Alloy Die Steel
TETON — Ball Bearing Steel
SEMINOLE — "Fool Proof" Chisel Steel
YUMA — Chrome Magnet Steel

We make *Ludlum Steels* in Electric Crucible Furnaces, because electric crucible furnace steels have greater strength and purity.

The Electric Crucible Furnaces in which Ludlum Steels are made were developed in our own plant to meet our own requirements.

This is the chief reason why Ludlum Steels are *consistently uniform.*

Do you know that Ludlum Steels have been selected by the majority of large users and twist drill and milling cutter manufacturers, as the steels best suited for their purposes?

Prompt shipments from our warehouse stock at Watervliet, N. Y.; Detroit, Mich.; Chicago, Ill.; or Cambridge, Mass., handled through our Branch Offices.

LUDLUM STEEL COMPANY, General Offices and Works: WATERVLIET, N. Y.

Branch Offices: Chicago, Cambridge, Mass., Detroit, Buffalo, New York City, Cincinnati, Cleveland, Philadelphia, Pittsburgh

crane for the New Castle, Del., plant of the Seaboard Steel Co., which recently took over the Tacony Steel Co. This business went to the Morgan Engineering Co., Alliance, O. Further cranes are to be required, it is understood, within the relatively near future. Tedeschi & Tedeschi, Astoria, L. I., has purchased a 20-ton electric crane with 39-foot span, from the Bedford Foundry & Machine Works, Bedford, Ind. This latter company has also received an order through the J. G. White Engineering Co., New York City, for a 7½-ton overhead crane for the Nichols Copper Co., Laurel Hill, L. I. The eight or nine cranes remaining are to be placed shortly. The New York & Pennsylvania Co., Johnstown, Pa., has purchased two locomotive cranes, of 20 tons capacity, and 50-foot boom, from the Ohio Locomotive Crane Co., Bucyrus, O. The American Brakeshoe & Foundry Co. is expected to be in the market shortly for cranes for its proposed plant in Newark.

The Lidgerwood Mfg. Co., Harrison, N. J., is reported to have placed a 15-ton electric crane, with 58 foot span, with the Shaw Electric Crane Co., Muskegon, Mich. A special 5-ton overhead crane by the Brooklyn Rapid Transit Co., Brooklyn, has been placed with Victor R. Browning, Cleveland.

The committee on crane specifications of the Material Handling Machinery Manufacturers' association was scheduled to meet in New York City on March 22, to consider specifications for wharf cranes to be required by the Pan-American Terminal & Dock Corp., 233 Broadway, New York City, but it is understood now that this meeting has been postponed for several weeks.

Lack of Motors Becomes a Factor in Pittsburgh

DEMAND for machine tools in the Pittsburgh district continues good although most of the inquiries are for individual pieces. Dealers declare they are finding it extremely hard to secure 5, 7½ and 10 horsepower motors for driving lathes, drills and shapers, as the electric equipment companies are sold on these small motors so heavily that they are not promising delivery more promptly than from 16 to 25 weeks. Inability of dealers to secure motors promptly frequently results in the loss of a sale of machines from stock. Demand for motors for driving washing and sewing machines and for household purposes is on such a tremendous scale that all of the electric equipment manufacturers are crowded to capacity with orders for small motors.

While the railroads are buying occasional tools for their shops, none of them has put out lists as yet. No important crane or heavy equipment orders recently have come out in this district but the Pittsburgh Plate Glass Co. is expected to close shortly on the cranes desired for its Ford City, Pa., and Kokomo, Ind., plants.

Miscellaneous Inquiries Continue Numerous in Cleveland

BECAUSE the scattered inquiries reaching the Cleveland machine tool market are sufficiently numerous, little attention is being paid to the absence of large lists. Dealers are busily engaged endeavoring to fill the small orders which come their way from manufacturers who are piecing out and replacing their equipment. Inquiries call for one, two, three and in some instances, four pieces, although an exception is noted now and then, where somebody wants a dozen lathes, a half dozen multiple drills, eight or ten automatics or a battery of turret lathes. Orders which are being placed are fairly numerous, although dealers claim that were they in a position to give better deliveries, they would be able to book more business. This is having a favorable effect upon the used and rebuilt machinery market. Many manufacturers who cannot wait to have their orders filled with new equipment are taking on second hand machines. For the better class of this, there is a keen demand and since it is strictly a seller's market, comparatively high prices are being obtained.

One sizable order placed recently by the Cleveland Twist Drill Co., Cleveland, called for six and 8-foot Reed & Prentice lathes and it is understood that 10 more Lodge & Shipley and Hendey lathes are desired by that company, if that order has not already been placed. The Pierce-Arrow Motor Car Co., Buffalo, which is understood to have closed on about $1,000,000 worth of machine tools in recent months, is about to purchase $6000 or $8000 worth of small equipment. On the fact that its appropriation for machinery is exhausted prevents this company from making additional machine tool purchases at this time. It is the opinion of those in a position to know, that considerable production is wanted and it will not be long until another appropriation is arranged and additional machines purchased. The Jordan Motor Car Co., Cleveland, is another automobile manufacturer to enter the market lately. It wants a couple of lathes and is understood to be in need of multiple spindle drills.

Dealers' representatives have been at work for about a year with the Wellman-Seaver-Morgan Co., Akron, O., on tractor manufacturing equipment. Some few purchases have been made and an unverified report has it that while the company will continue to produce tractors, it will not be on any such scale as originally contemplated and the manufacture of motors will be substituted.

As referred to above, smaller inquiries are frequently received from scattered sources. W. A. King, 117 Linden avenue, Memphis, Tenn., still is taking bids on considerable metalworking machinery, including lathes, shapers, drills, etc. The Martin Steel Products Co., Mansfield, O., wants a large geared press, capable of gang punching sheets approximately 36 inches x 11 feet. This is for its new plant for which it recently purchased considerable equipment. The Fairbanks Co., Cleveland, is in the market for a pipe machine, while the American Pipe & Tube Co., Toledo, O., has taken quotations on a Standard Welland 8-inch pipe threading and cutting machine. The Ludlow Mfg. Co., 59-61 Linden street, Ludlow, Ky., manufacturer of sheet metal ware, wants one No. 16 and one 39 Bliss presses, or their equivalent, with or without horns. The Frigidaire Corp., 725 Scotten avenue, Detroit, is seeking a 6-inch pipe machine with capacity to cut pipe from 1 to 6 inches. The Canton Drop Forging Mfg. Co., Canton, O., is in the market for lathes while the W. D. Anderson Co., San Bernarding, Cal., wants 15 to 18-inch x 8 to 10-foot or longer lathes with quick change gears and taper attachments, as well as screw cutting machines up to 2-inch round capacity. The Toledo Tool & Engineering Co., Toledo, O., wants a Snyder 25-inch drill and the Holt Mfg. Co., Peoria, Ill., wants three machines as follows: Two No. 13 Natco multiple drills, 12 x 18-inch rectangular heads, with two speeds to each spindle, arranged for 16 drills and equipped with eight 1¼-inch and 1-inch spindles each, No. 2 Morse taper, 22-inch rotating table arranged for motor drive but not including the motor or other electrical equipment, and one No. 14 Natco multiple drill, 16 x 24-inch rectangular head, arranged for 22 spindles and equipped with fourteen 1¼ and eight 1½-inch spindles, No. 2 Morse taper, lubricating pump and 34-inch rotating table, arranged for motor drive, but not including the motor or other electrical equipment. The Evansville Structural Supply Co., Evansville, Ind., is in the market for used alligator shears including electric motors for shearing round and square reinforcing bars up to and including 1¼ inch.

Industrial buildings in this district point to some

Rolling Mill Jim Wants to Know

Say, Fellas:

Has 'prohibition brought you 'sunshine or moonshine? HUBBARD ROLLS will bring you sunshine by relievin' you of roll troubles.

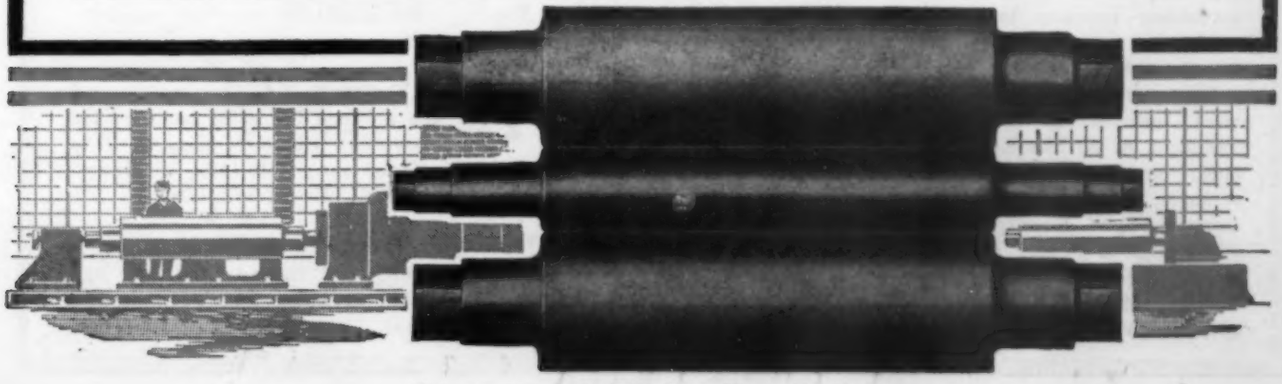
So Long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings



Say you saw it in THE IRON TRADE REVIEW

large machine tool and machinery needs soon. The Monarch Mfg. Co., Tiffin, O., will equip a new plant and large boiler room; the Canton Pattern & Mfg. Co., Canton, O., is getting ready to build. The Otis Steel Co., Cleveland, will require considerable equipment for its large new machine shop. The Columbia Enameling & Stamping Co., Terre Haute, Ind., has awarded the contract for an addition which without equipment will cost $50,000. The Albion Bolt Co., Albion, Mich., is to buy equipment for a plant addition, while the Tool Engineers Sales Co., 305 Scherer building, Detroit, is understood to be planning a new plant at Ann Arbor, Mich., for the manufacture of machine tools. The Crosby Co., 183 Pratt street, Buffalo, which does metal stamping, finds it necessary to build and equip a 48 x 125-foot addition.

Casting Shortage Effects Toolbuilders

PRICE changes, all advances, registered by a number of builders 10 days ago seem to have been for the purpose of readjusting the market and have not been followed by general advances. Difficulty in obtaining raw material, especially castings, is beginning to be felt by builders of tools and this is getting to be given as a reason for slow delivery on finished equipment. This is especially aggravating when other departments of manufacturing are working better and foundries are being besieged to turn out their product more rapidly.

Demand in the Chicago market continues steady in small lots, and more especially for light equipment, heavier tools not being much to the fore. Cancellation of orders for equipment to go to the Samson Tractor Works at Janesville, Wis., on which construction has been stopped, have not yet made their appearance. One report relative to this plant is that it will be converted into an assembly plant rather than a tractor manufacturing unit. This is not verified.

Canadian Railway and Automobile Buyers Busy

EXTENSIVE equipment orders which recently have been placed by Canada's railroads are being reflected in the machinery and machine tool trade of the dominion. Industrial plants all over Canada are being enlarged and as a consequence the demand for machine tool equipment is brisk. Automobile concerns and the railway companies are doing the greater part of the buying and dealers expect to see some good sized lists from this quarter within the new few weeks.

Municipal governments are preparing to spend considerable sums this spring on new plants and equipment. This work will include the construction of waterworks plants, sewage plants, electric light and power plants, the building of roads, public buildings, etc., and as a consequence many towns and cities are now inquiring for prices on equipment. Calgary, Alta., is asking for prices on street railway motor-generator as well as modern liquid chlorine apparatus. Radville, Sask., David Bradley, clerk, is in the market for a suction gas producer and engine, 75 to 100 horsepower, for electric lighting plant.

Second-hand and rebuilt equipment also is in good demand and dealers are receiving numerous inquiries for single tools for foundries, machine shops, etc., which are finding it necessary to replace certain lines of equipment. Although there is a slight improvement in deliveries, dealers are still experiencing some difficulty in giving definite shipping dates. Dealers in both Toronto and Montreal state that business is active and that they expect even greater buying during the next month or two. The Canadian Paper Barrel Co. has secured a building at 227 Wellington street, Montreal, Que., and is installing machinery for the manufacture of paper barrels, buckets, etc. George L. Dourne and F. A. Schaff of New York, have purchased the Sherbrooke Iron Works, Sherbrooke, Que., and will install machinery and equipment for the manufacture of locomotives, marine and stationary superheating apparatus, etc. The Collis Leather Co., Tyler street, Aurora, Ont., S. M. Collis, manager, will build an addition and is receiving prices on further equipment. W. J. Baldwin, Aurora, Ont., will build a new flour mill and will purchase equipment. Malloy & Brian, Haliburton, Ont., will erect a sawmill to cost $40,000, and is asking for prices on machinery and equipment. The Tilbury Brick & Tile Co., Tilbury, Ont., H. A. Hallatt, manager, is asking for prices on equipment for a new $30,000 plant. The Centralia Flax Mills Co., Centralia, Ont., wants prices on flax mill equipment, as does William Ward, Lucan, Ont. The Elgin Milk Products Co., St. Thomas, Ont., will build a milk factory and wants prices on machinery and equipment. Rouleau & Fils, Grand Mere, Que., will erect a sawmill to cost $50,000 and will require machinery and equipment.

Business Changes Recently Announced by the Trade

ON MARCH 20, the Ferranti Electric Co. of Canada, Ltd., Toronto, Ont., changed its name to the Ferranti Meter & Transformer Co., Lt., without changing its capital stock of $250,000. The former was a sales and assembling company but the new company manufactures meters, transformers, etc. It has purchased a factory and has most of its equipment installed. Officers follow: President, A. W. Tait, London, England; vice president and general manager, G. C. Royce, Toronto; secretary, F. W. Rowntree, Toronto. Head office is located at 26 Noble street, Toronto, with branches in Halifax, Montreal, Winnipeg, Calgary and Vancouver.

Under the name of the Standard Gear Co., 700-704 Commonwealth avenue, Detroit, the following companies have been consolidated and reincorporated: Langtry Machine Co., W. M. B. Machine Co., Michigan Standard Gear Co., Detroit Standard Gear Co., and the Mead Mfg. Co. Dell A. Mead is president and treasurer and W. R. Mead is vice president and secretary.

* * *

James Leffel & Co., Springfield, O., maker of turbine water wheels, have moved Boston offices from 79 Milk street to room 610, Compton building, 161 Devonshire street, to be in charge of A. S. Addison, of Springfield.

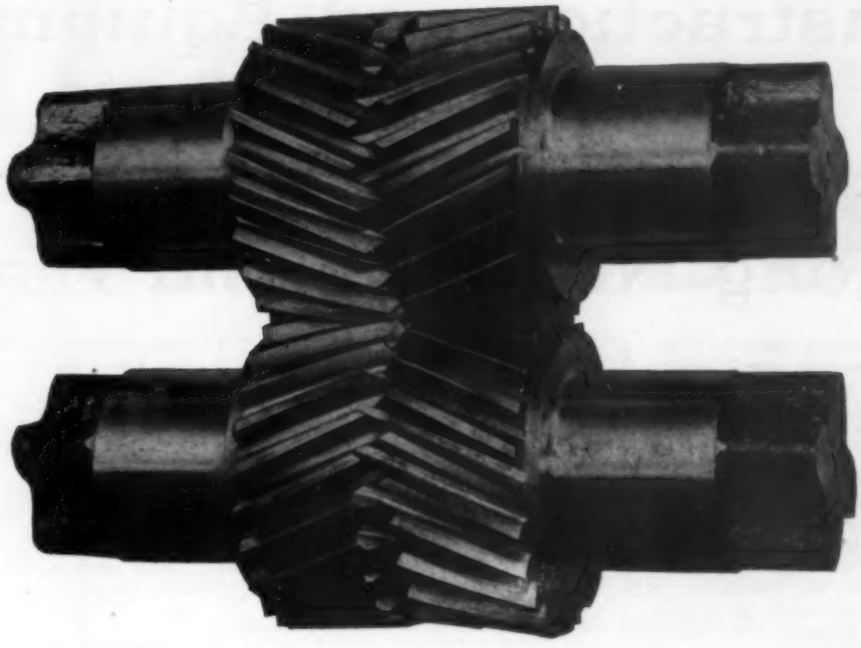
The Shawinigan Electro Products Co., Baltimore, announces it has changed its corporate name to the Baltimore Electro Alloys Co. with offices at 1611 Lexington building, Baltimore. The company manufactures electric ferrosilicon of 80 per cent grade for merchant consumption.

* * *

The Lindsley Co. has incorporated its business under the name of the American Chartered Co., of New York, Inc., 1416-1418 Woolworth building, New York City.

* * *

The Columbia Motors Co., Detroit, has moved into its new plant at Mack and Beaufait avenues.



MILL PINIONS

MADE FROM

Open Hearth Steel Castings

We own and operate one of the largest steel foundries in the West, making castings from 1 to 100,000 pounds.

THE FALK COMPANY

MILWAUKEE, WIS.

AGENTS: Pittsburgh—W. O. Beyer, 1007 Park Bldg. New York—M. P. Fillingham, 50 Church St. Wilkes-Barre—Vulcan Iron Works. Denver—Denver Engineering Works. San Francisco—F. W. Grimwood, Rialto Bldg.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

AUGUSTA, ME.—The Submarine Exploration & Recovery Co. has been incorporated with $10,000,000 capital. P. A. Leland is treasurer.

KITTERY, ME.—The Marion Silver Mines Co. has been incorporated with $300,000 capital. Horace Mitchell is president.

BOSTON.—The Barker Steel Co. has been incorporated with $20,000 capital by Harold L. Barker, Harold Stevens, Brookline, Mass., and Hugh J. Shaw.

BOSTON.—The Cadrain Auto Motors Corp. has been incorporated with $200,000 capital, by Joseph M. Cadrain, George J. Cadrain and Albert L. Ayer.

BOSTON.—The Ideal Block Shaping & Trimming Machine Co. has been incorporated with $50,000 capital, by Samuel Brenner, Henry H. Levenson and J. W. Lee.

BOSTON.—F. W. Montgomery, Inc., has been incorporated to make sheet metal products with $12,500 capital by Nathan K. Gallinger, F. W. Montgomery and A. T. Parsons.

BOSTON.—The Webster Automobile & Machine Co. has been incorporated with $10,000 capital by Louis Levine, Julius B. Meltz, Everett, Mass., and Julius Katz.

BOSTON.—The Canbec Fire Extinguisher Co., Inc., has been incorporated with $1,000,000 capital, by Joseph Beauregard, Providence, R. I.; Arthur Laberge, Pawtucket, R. I., and Henry Girard, Lowell, Mass.

BOSTON.—The Sterling Roofing & Mfg. Co. has been incorporated with $500,000 capital, by Gerald B. Litchfield, Malden, Mass.; Edward A. Durant, New Bedford, Mass., and Daniel Needham.

BOSTON.—The Automotive Radiator Corp. has been incorporated with $50,000 capital, by John Gold and Richard L. Freeman, Lowell, Mass., and F. Hunt, Cambridge, Mass.

BOSTON.—The Tait-Marston Engineering Co. has been incorporated to operate a foundry and machine shop with $50,000 capital, by W. E. Tait, Winthrop, Mass.; William M. Marston, Cambridge, Mass., and Thomas Lithgow.

BROCKTON, MASS.—The Brockton Cornice & Sheet Metal Co. has been incorporated with $50,000 capital, by Edward J. Meagher, A. M. Fox and Donald Edmonston.

CHARLESTOWN, MASS.—Shea & Donnelly have let a contract for a 1-story mill building, 90 x 140 feet.

EVERETT, MASS.—The Sexton Can Co. will erect a 2-story, 80 x 115-foot plant addition.

FALL RIVER, MASS.—The Fall River Steam & Gas Pipe Co. will erect a 2-story, 50 x 100-foot building at a cost of $50,000.

FITCHBURG, MASS.—The Crocker-Burbank Co. has let a contract for a plant extension to include a machine room, at a cost of $400,000.

INDIAN ORCHARD, MASS.—The Chapman Valve Mfg. Co. has let the contract for a 1-story, 160 x 200-foot factory to cost $45,000.

PITTSFIELD, MASS.—The General Electric Co. has purchased 58 acres on which it will erect a plant.

QUINCY, MASS.—Vedoe Peterson, 167 Oliver street, Boston, plans a machine shop here, 1-story, 50 x 117 feet.

SALEM, MASS.—The Hebbard-Haskell Corp. has been incorporated to make automobile accessories and equipment with $20,000 capital, by Carl P. Hebbard, William A. Haskell, Lynn, Mass., and Charles P. Hammond.

SOUTH SOMERSET, MASS.—The Crowninshield Shipyard is reported planning a plate shop at a cost of $60,000.

SPRINGFIELD, MASS.—The Diamond Match Co. plans a plant here which will include a power house.

SPRINGFIELD, MASS.—The F. F. Storms Drop Forging Co. has purchased five acres on which it plans a machine shop.

WAKEFIELD, MASS.—The Heywood Bros. & Wakefield Co. is taking bids for a plant addition to cost $125,000.

WEST LYNN, MASS.—The General Electric Co. is taking bids on a 1-story, 150 x 180-foot plant addition.

WORCESTER, MASS.—The Campbell Mfg. Co. has been incorporated to build textile machinery with $20,000 capital, by John M. Thayer, A. H. Bullock and James J. Hurley.

PROVIDENCE, R. I.—The Winter Machine Co. has been incorporated to build refrigerating machinery with $200,000 capital by William E. Spranklin, Raymond W. Tibbetts and Robert S. Emerson.

ANSONIA, CONN.—Plans have been completed for a 2-story, 75 x 125-foot factory for the Ansonia & Co. A power house will be erected later.

BRIDGEPORT, CONN.—The Eastern Malleable Iron Works has let a contract for a 70 x 175-foot foundry, to cost $40,000.

BRIDGEPORT, CONN.—The Vecsey-Zold Co., Inc., has been incorporated to do sheet metal work, etc., with $6000 capital by L. A. Vecsey, Stephen Zold and Frank Slovensky Jr.

MERIDEN, CONN.—The International Silver Co. has let the contract for two 1-story additions, to cost $35,000.

NEW BRITAIN, CONN.—The New Britain Toy Mfg. Co. has been incorporated with $50,000 capital, by Samuel Fleming, H. S. Panis, Harry Bronstein and others.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

Ten motors and controllers, 5813, Portsmouth, March 26.
Two motors and controllers, 5814, Newport, April 6.
Two electric hoists, 5815, Philadelphia, March 30.
One milling machine, 5817, Newport, April 6.
One electric traveling crane, 5821, Portsmouth, April 6.
Two milling machines, 5827, Newport, April 9.
Six swivel and machinists' vises and 7 universal chucks, 5828, Alexandria, April 2.
Two gear cutting attachments, two universal dividing heads, two circular milling attachments and two circular tables, 5829, Alexandria, April 2.
One milling machine, 5832, Newport, April 9.
Two toolmaker's engine lathes, 5833, Newport, April 9.
Two milling machines,, 5834, Newport, April 9.
Three boring bars, 5835, f.o.b. works, April 6.
End mill cutters and reamers, 5837, Newport, April 2.

Schedule numbers, places of delivery and dates of openings follow the specifications of the tools.

North Atlantic States

BROOKLYN, N. Y.—The Mechanic Metal Bed Co. has been incorporated with $50,000 capital, by M. M. Pausner, A. and S. L. Shapiro, 271 Broadway.

BROOKLLN, N. Y.—The Reliance Tin Can Co. has been incorporated with $10,000 capital, by A. H. Clissold, C. K. and W. C. Scofield Jr., 41 Park Row.

BROOKLYN, N. Y.—The Doehler Die Casting Co. has bought seven acres at Chicago, on which it is now building the first unit of a new plant.

BROOKLYN, N. Y.—The Union Machine & Welding Co. has been incorporated with $30,000 capital, by M. T. Ergesen, A. Bjorkman and R. L. Arson, 567 Fiftieth street.

BROOKLYN, N. Y.—The Protective Window Lock & Alarm Corp. has been incorporated with $6000 capital, by S. Fier, B. D. Goldstein and J. Schneider, 1646 Park place.

BUFFALO.—The Dicks Stamping Co. has been incorporated with $50,000 capital, by W. Dicks, E. T. Owen and E. A. Jones, Kenmore.

ELMIRA, N. Y.—The Elmira Foundry Co., Main and Woodlawn avenue, plans a plant, 119 x 560 feet, at a cost of $200,000.

LAWRENCE, N. Y.—The Westervelt Machine Co. has been incorporated with $50,000 capital, by L. Westervelt, W. H. Kirby and H. A. Blake.

MT. VERNON, N. Y.—The Westchester Auto Radia-

INGOT MOULDS

Cupola or *Direct Metal*

All Shapes and Sizes

Split or Solid—Rough or Machined.

Top or Bottom Cast.

Safeguard your operations and insure satisfaction by placing your requirements in our hands.

Bessemer
Iron Castings

Hearth Jackets; Cooling Plates; Cinder Pots; Blast Furnace Bells; Sprue Plates; Runners; Fountains; Castings for Chemical Plants, etc.

Valley Mould and Iron Corporation

***Main Office,* SHARPSVILLE, PA.**

Sales Office
Pittsburgh, Oliver Bldg.

WORKS { **Pittsburgh, Pa.**
Josephine, Pa.
Sharpsville, Pa.
West Middlesex, Pa.

"The Largest Manufacturers of Ingot Moulds in the World"

tor Works has been incorporated with $6000 capital, by A. and C. Goldstein and M. Sussman, North Tarrytown, N. Y.

NEW YORK.—The Mica Insulator Co., 68 Church street, is having plans prepared for a plant addition to cost $150,000.

NEW YORK.—The General Electric Co. has acquired under lease, with option to purchase, the Remington Arms plant, Bridgeport, Conn.

NEW YORK.—The Universal Ornamental Iron & Steel Works, 940 East 174th street, plans alterations to its office and shop.

NEW YORK.—The Colonial Chandelier Works has been incorporated with $100,000 capital, by G. S. Fulton, J. and H. W. Gross, 1017 Intervale avenue.

NEW YORK.—The Scotch Boiler & Equipment Co. has been incorporated with $10,000 capital, by G. A. Senior, A. M. Schlieman and H. Rosenthal, 2118 Dean street.

NEW YORK.—The Quinlan-Treiber Corp. has been incorporated with $10,000 capital, to make airplane and auto accessories, by J. T. and L. M. Quinlan and P. J. Treiber, 97 Chauncey street, Brooklyn, N. Y.

NEW YORK.—The Corrugating Machinery Corp. has been incorporated with $125,000 capital, by S. Samuels, M. P. McManiman and J. D. Goldstein, 97 Ft. Washington avenue.

EAST PITTSBURGH, PA.—The Westinghouse Electric & Mfg. Co. has purchased two acres on which it plans a plant for the use of the Pittsburgh Meter Co.

PHILADELPHIA.—A $1,000,000 plant will be erected by the American Mfg. Co. It is to consist of a factory building, 2-stories, 150 x 383 feet; two warehouses, 2-stories, 150 x 161 feet; one 1-story warehouse, 90 x 100 feet; a power house and machine shop, 32 x 100 feet, and a 2-story open room.

PITTSBURGH.—Somers, Fitler & Todd Co. plans an 8-story building.

SHARON, PA.—The National Malleable Castings Co. has acquired the building of the Aschman Steel Casting Co. and is replacing it with a larger and more modern structure.

WAYNESBURG, PA.—The American Steel Co., Park building, Pittsburgh, will reconstruct the annealing and finishing departments of its tin plate plant here, recently damaged by fire.

JERSEY CITY, N. J.—The William Crabbe Co., 1328 Broadway, New York, manufacturer of gas appliances, will erect a 2-story plant.

NEWARK, N. J.—The Hydraulic Ash Hoist Co. has been incorporated with $50,000 capital by C. H. Fay, V. F. Davis and E. J. Delaney.

NEWARK, N. J.—The T. L. Smith Co., Milwaukee, has leased a building here, for the purpose of manufacturing concrete mixing machinery.

NEWARK, N. J.—With a capital of $350,000, the Timerol Chemical Co., Inc., has been organized to manufacture chemical and pharmaceutical products. Philip N. Tilden, 220 Broadway, New York city, is one of the incorporators.

BALTIMORE.—The Autogenous Welding & Machine Co. plans a plant addition, 2-stories, 25 x 150 feet, to cost $12,000.

BALTIMORE.—Bids were closed by the Union Shipbuilding Co. recently on contracts for a carpenter and joiner shop.

BALTIMORE.—The No-Dip Faucet Co., 6 Clay street, has been incorporated with $100,000 capital, by W. M. Schmidt, B. H. McDuffie and M. M. Swihart.

BALTIMORE.—A site of eight acres has been purchased by the Prest-O-Lite Co. in the Orangeville section, on which to build a factory to manufacture automobile lighting equipment.

BALTIMORE.—The Emry Steel Castings Co., which recently reincorporated and took over the property of the Emry Steel Co., has purchased a building on South Charles street, to which it will move its plant and equipment.

NORFOLK, VA.—The Inter-Ocean Iron Works has been incorporated with $100,000 capital, by S. Anderson, A. R. Anderson and others.

Central States Activity

APPLETON, WIS.—The machine and blacksmithing business of Conrad Milhaupt has been incorporated as the Milhaupt Spring & Automobile Co. with a capital of $40,000. Conrad, Edgar and Leo Milhaupt are the principal owners.

BURLINGTON, WIS.—The Burlington Brass Works is having plans prepared for a foundry and shop addition, 92 x 144 feet, to cost $85,000. C. R. McCanna is president.

GREEN BAY, WIS.—Some new equipment is being purchased by the Massopust Sign Co. to provide for the manufacture of electric advertising signs.

HARTFORD, WIS.—The Kissel Motor Car Co. is reported having plans prepared for the enlargement of its steam generating plant.

KENOSHA, WIS.—The Adjustable Door Stop Co., capitalized at $25,000, has been chartered to manufacture specialties and automotive accessories by G. W. Skilbeck and others.

KENOSHA, WIS.—The Holm Mfg. Co. has been organized to manufacture tools, dies, jigs, special machinery, etc., and will build and equip a new plant at a cost of $50,000. W. C. Holm is general manager.

LAKE GENEVA, WIS.—An option has been taken by the Triner Scale Co. on a site here, on which it plans a plant, which will include a shop for the manufacture of aluminum utensils. James M. Triner is president.

LAKE MILLS, WIS.—An addition, 45 x 75 feet, will be made to the brass foundry of the local plant of the Creamery Package Mfg. Co., Chicago.

MADISON, WIS.—The Pleasant Spring Light & Power Co. has been incorporated with $20,000 capital, by Jacob Asleson and Andrew Holton.

MILWAUKEE.—The Webr Steel Co. has broken ground for a 1-story addition, 60 x 120 feet, to its cleaning room and will install a 10-ton crane. Some new sand blasting equipment has been contracted for.

MILWAUKEE.—The Moe-Bridges Co., 60-64 Third street, manufacturer of electric fixtures, etc., has increased its capital from $40,000 to $100,000. The plant will be enlarged.

MILWAUKEE.—The Northern Equipment Co., capitalized at $10,000, has been chartered to manufacture coal conveyors and other industrial devices by H. C. Carter, John M. Clarke, and John P. Donnelly.

MILWAUKEE.—Articles of incorporation have been filed by the National Plating Co. to do a general galvanizing, tinning, electro-plating and polishing business. The company, which is capitalized at $25,000, was incorporated by Adolf F. Hafner, Caswell block; John M. Miszewski and Joseph C. Bykowski.

RACINE, WIS.—The capital of the Splitex Radiator & Mfg. Co. has been increased from $50,000 to $150,000, to finance a plant addition.

SHEBOYGAN, WIS.—The Jenkins Machine Co., Eighth street, A. Stedman, manager, will build a 1 and 2-story addition to its machine shop, 150 x 200 feet, costing $50,000.

SHEBOYGAN, WIS.—The Sheboygan Cigar Box Lumber & Mfg. Co. is having plans prepared for a new building to be used as a power plant, machine shop and saw filing room. New steam generating equipment will be purchased.

WEST BEND, WIS.—The capital of the West Bend Farm Equipment Co. has been increased from $125,000 to $175,000. A plant addition is now under construction and some new equipment is being purchased.

ALBION, MICH.—The Parker Collapsible Rim Co. will move its plant equipment to this city and will occupy part of the plant of the Union Steel Products Co.

BATTLE CREEK, MICH.—The Clark Equipment Co., Buchanan, Mich., will build a 1-story plant, 100 x 450 feet, and 50 x 450 feet.

BELDING, MICH.—The Jacquet Motors Co. has purchased 25 acres on which it is reported planning to erect a plant. A. J. Jackson is president.

CADILLAC, MICH.—The Northern Machine Co. has been incorporated with $20,000 capital, by L. T. M. Foster, and others.

DETROIT.—The Detroit Transmission Co. has been organized by Charles W. Kuehl, 1006 Hammond building, and others, with $500,000 capital.

DETROIT.—The Superior Machine & Engineering Co., 51 East Fort street, will build a 3-story plant, 100 x 120 feet, costing $100,000.

DETROIT.—The Modern Appliance Co. has been incorporated with $45,000 capital to manufacture mechanical machinery.

DETROIT.—The Ka-Wood Gear & Machine Co. has been chartered with $50,000 capital, by A. C. Underwood, 1049 Concord avenue, and others.

DETROIT.—The Art Tool & Die Co. has been organized with $10,000 capital, by T. W. Murtagh, 584 Lennox avenue, and others.

DETROIT.—The Standard Forge Co. has been organized with $15,000 capital, by A. G. Ferney, 680 Lakewood boulevard.

DETROIT.—The Automotive Engine Parts Co. has been incorporated with $150,000 capital, by D. W. Burke, 2636 West Grand boulevard, and others, to manufacture automobile engines, etc.

DETROIT.—The Michigan Pipe Fitting Co. has been chartered with $200,000 capital, by A. Lukomsky 2417 East Grand boulevard, and others, to manufacture pipes and fittings.

DOWAGIAC, MICH.—The Premier Warm Air Heater Co. has purchased six acres as a site for a plant addition. William F. Judd is president.

GRAND RAPIDS, MICH.—The Grand Rapids Piston Ring Co. has been incorporated to manufacture piston rings and castings, with $30,000 capital, by George O. Burchard and others.

JACKSON, MICH.—The Jackson Foundry Co. will erect a building, 100 x 140 feet. George Dugot is president.

LANSING, MICH.—The Red Arrow Motors Co. has been incorporated with $1,000,000 capital by I. L. Stoney, Lansing, Mich.; A. B. Bowman and Louis O'Neil. It is expected the company will erect a plant here.

MARYSVILLE, MICH.—The General Aluminum & Brass Co. will build a foundry, 380 x 420 feet, costing $50,000.

ST. JOSEPH, MICH.—The Upton Machine Co. is having plans prepared for a 1-story machine shop, 90 x 175 feet, to cost $50,000.

YPSILANTI, MICH.—The Ypsilanti Machine Works has been chartered with $20,000 capital, by George W. Walterhouse and others to manufacture mill machinery.

CHICAGO.—The Tarrant Foundry Co., 363 West Grand avenue, has plans for a storage building.

CHICAGO.—The Union Drop Forge Co., 1746 North Kostner avenue, plans a plant to cost $25,000.

CHICAGO.—The Chicago Faucet Co., 2712 North Crawford avenue, is having plans drawn for a plant addition, 1-story, 50 x 125 feet, to cost $60,000.

CHICAGO.—Plans are being drown for a plant, 1-story, 100 x 125 feet, for the Columbia Scale Co., 2439 North Carford avenue.

CHICAGO.—The Chicago Copper & Iron Works, 1220

From Mine to Furnace
THE CLEVELAND-CLIFFS IRON CO.
Dealers in All Varieties of
LAKE SUPERIOR IRON ORES
20 PRODUCING MINES
Reliability in Shipments is assured through control of Ore Carrying Railroads ownership of Ore Docks and of a large Fleet of Steamships
THE CLEVELAND-CLIFFS IRON COMPANY
C I C
Cleveland Ohio
ESTABLISHED 1850

Say you saw it in THE IRON TRADE REVIEW

Belmont avenue, plans a plant addition, 1-story, 50 x 55 feet.

CHICAGO.—The Cochrane Mfg. & Forging Co., 7880 Woodlawn avenue, plans a plant, 1-story, 50 x 420 feet, to cost $50,000.

CHICAGO.—The Joliet Railroad Suply Co., 947 East Ninety-third street, plans a plant at a cost of $100,000.

CHICAGO.—Arnold Bros., packers, 660 West Randolph street are building a 1-story machine shop, 40 x 100 feet to cost $14,000.

CHICAGO.—The Channel Chemical Co., 4501 South Western avenue, is building a 4-story plant, 150 x 300 feet, to cost $400,000.

CHICAGO.—The International Molding Machine Co., 2634 West Sixteenth street, will build an addition, 40 x 88 feet, costing $37,000.

CHICAGO.—The Acme Steel Goods Co., 2834 Archer avenue, will build an addition, 150 x 600 feet.

CHICAGO.—The Block Mfg. Co., manufacturer of sheet metal goods, 1219 West Lake street, will build a 2-story plant, 95 x 112 feet, costing $60,000.

CHICAGO.—The D. O. James Mfg. Co. will build a 3-story addition, 48 x 120 feet, equipped with a 4-ton traveling crane, at a cost of 45,000.

CHICAGO.—The Pheoll Mfg. Co., hardware supplies, 5712 Roosevelt road, S. M. Phelps, secretary, will build a 1-story addition 115 x 218 feet, costing $50,000.

CHICAGO.—The Chicago Copper & Iron Works, 1220 Belmont avenue, will build a 1-story addition, 50 x 55 feet. M. F. Strauch, 1356 Diversey parkway, is architect.

CHICAGO.—A 2-story annex, 120 x 123 feet, costing about $125,000, is to be built by the Advance Spring & Wire Co., of which Frederick C. Mueller is president.

CHICAGO.—Architect Albert Anis, 139 North Clark street, is preparing plans for a foundry, 100 x 250 feet, to cost $75,000. The name of the owner has been withheld.

CHICAGO HEIGHTS, ILL.—Chalmers & Williams, 72 West Adams street, Chicago, are having plans prepared for an iron foundry at Chicago Heights to cost $300,000.

ELGIN, ILL.—The Non-Freeze Silo Co. has been incorporated with $50,000 capital to manufacture silos, etc., by H. F. Mueller, N. G. Mueller and C. M. Boos.

GARY, IND.—The National Spring Products Co. will erect a 4-story building at an estimated cost of $500,000.

INDIANAPOLIS.—The plant of the Chapman-Price Steel Co. recently was damaged by fire.

INDIANAPOLIS.—The Aluminum Castings Co. has been incorporated with $1,000,000 capital, by H. C. Smith, W. R. Macy and W. H. Breeden.

MARION, IND.—The Wiley Machine & Tool Co. has been incorporated with $15,000 capital, to manufacture tools, etc., by L. M. Wiley, R. R. Wiley and R. B. Wiley.

MUNCIE, IND.—The Eagle Foundry Co., Tenth and Liberty streets, plans a foundry, 150 x 200 feet.

PERU, IND.—The Automotive Parts Mfg. Co. has been incorporated with $25,000 capital, by J. C. Whisler, William H. Church and William H. Haupert.

PLYMOUTH, IND.—The Keystone Foundry Co. has awarded contracts for a large plant addition.

UNION CITY, IND.—The Bailey Mfg. Co. has been incorporated with $50,000 capital, to manufacture auto parts, by P. I. Turner, N. H. Parker and H. I. Willcutts.

CANTON, O.—The Canton Pattern & Mfg. Co. plans a plant.

CINCINNATI.—The Paramount Auto Parts Co. has been incorporated with $50,000 capital, by F. S. Rohan, T. W. Alderman and others.

CINCINNATI.—The Trojan Brass Mfg. Co. has been incorporated with $50,000 capital, by J. Luebbe, L. Luebbe, A. Schreck and W. B. Hillebrand.

CLEVELAND.—The Enamel Products Co. plans a 1-story addition, 40 x 51 feet.

CLEVELAND.—The contract has been awarded for a plant for the Fisher Body Ohio Co.

CLEVELAND.—The City Machine Co. plans a plant, 1-story, 50 x 126 feet, to cost $12,000.

CLEVELAND.—The Otis Steel Co. plans a machine shop, 1-story, 322 x 956 feet.

CLEVELAND.—The Western Novelty Mfg. Co. will revise plans and take new bids on a plant, 1-story, 50 x 130 feet, estimated to cost $25,000.

CLEVELAND.—The New Process File Co. has been incorporated with $25,000 capital, by R. G. Clapp, A. M. Bonis and others.

CLEVELAND.—The K. & P. Electric Motor Repair Co. has been incorporated with $10,000 capital, by G. H. Pardey, H. Wagner and others.

CLEVELAND.—The American Pressed Steel Co. has been incorporated by W. K. Seagrave, R. E. Boehm, E. A. Henry and A. M. Snyder.

CLEVELAND.—The Industrial Iron Works Co. has been incorporated with $10,000 capital, by N. A. Collier, A. M. Duffy, M. N. McFadden, G. R. Fischer and M. Beebe.

COLUMBUS, O.—The Atlas Brass Foundry Co. has had plans drawn for a foundry, 84 x 100 feet, to cost $20,000.

COLUMBUS, O.—The American Metal & Mining Products Co. has been incorporated with $10,000 capital, by H. M. Runkle, E. C. Bauer, O. E. Stevenson and others.

DAYTON, O.—The Advance Bed Parts Co. has been incorporated with $50,000 capital, by H. Bloch, I. Eisenberger, M. B. Okum, H. Bloch and R. Eisenberger.

FREMONT, O.—The Fremont Foundry Co., which was recently incorporated with $300,000 capital, has purchased the plant of the Lincoln Stove Co.

HAMILTON, O.—The Columbia Machine Tool Co. has a permit to erect an addition to its plant, to cost $30,000, and to be 85 x 175 feet.

LIMA, O.—The Garford Motor Truck Co. has started work on the first unit of its plant, which will cost $750,000.

MASSILLON, O.—The Lewis Electric Co. has been incorporated with $10,000 capital, by J. C. Lewis, F. L. Lewis and others.

MILWAUKEE.—The Milwaukee Gear Co. recently incorporated as a development of the Milwaukee Gear Works, has purchased a building which will be remodeled into a machine shop. The present equipment will be enlarged. Henry F. Trester is secretary.

POMEROY, O.—The plant of the Pomeroy Machine Co. recently was damaged by fire.

SHREVE, O.—The Shreve Foundry Co. has been incorporated with $40,000 capital, by J. H. Sowash, T. C. Bottomly, D. S. Freeman, A. F. Greter and P. Hutt.

TIFFIN, O.—The Monarch Mfg. Co. plans a plant which will include a large boiler room.

TOLEDO, O.—The Buntin Brass & Bronze Co., 27 Spencer street, plans a plant addition, 80 x 90 feet.

XENIA, O.—The Xenia Foundry & Machine Co. has been incorporated with $50,000 capital, by W. M. Huston, C. J. Held, W. F. Held, E. Peater and H. G. Sohn.

CHARLESTON, W. VA.—The T. & H. Specialty Mfg. Co. has leased the building formerly occupied by the West Virginia Timber Co. and will fit it up for the manufacture of talking machines.

HUNTINGTON, W. VA.—The Sax Stamping Co. plans a plant, 1-story, 100 x 100 feet, at a cost of $43,000.

PARKERSBURG, W. VA.—The Union Insulating Co. plans a plant, 80 x 216 feet, at a cost of $100,000.

In The South

COVINGTON, KY.—The Kenton Electric Co. has been incorporated with $10,000 capital, by Bayard and Charlton Thompson and A. C. Johnson.

HOPKINSVILLE, KY.—The Edwards Dust Spraying Machine Co. has been incorporated with $4000 capital, by R. E. Cooper, J. Arthur Wallace and D. G. Edwards.

LEXINGTON, KY.—The Hemp Co. of America will erect a hemp breaking plant, which will include a power plant and conveyor equipment.

LEXINGTON, KY.—George B. Caret and associates recently purchased the Jack Chinn Mineral Co.'s calcite mines and plans the installation of additional equipment.

LOUISVILLE, KY.—C. Von Allmen, Bank street, has a permit to erect a power plant.

LOUISVILLE, KY.—The Shannon Bed Spring Co., 632 East Main street, contemplates a factory building, 1-story, 120 x 200 feet.

LOUISVILLE, KY.—The Pittsburgh Fuel Co. plans the installation of a locomotive crane or dumping pit and conveyor system for handling coal to its elevators.

LOUISVILLE, KY.—The United States Tin Foil Co. recently chartered in Delaware with $3,000,000 capital, will enlarge its plant at an estimated cost of $125,000.

LOUISVILLE, KY.—The Scott Mfg. Co., F. H. Scott and others, will manufacture plumbers' machines for cutting soil pipe. The company was recently incorporated with $15,000 capital.

LOUISVILLE, KY.—George Holzbog, Louisville Steel & Iron Co., is said to have a proposition under consideration with J. W. Bell & Co., New York bankers, for resuming operations at the plant of the company. It is planned to produce steel bars.

LOUISVILLE, KY.—W. T. Godfrey, representing the Parker Axle & Products Co., New York, is in this city, in connection with a plan for establishing an axle manufacturing plant here.

NEW HAVEN, KY.—A. Cummins and T. J. McCann will erect a large garage, with a complete machine shop.

PADUCAH, KY.—Fred S. Lack is organizing a company here to engage in the manufacture of multiple disk aluminum wheels for automobiles.

SCOTTSVILLE, KY.—The machine shop of E. F. Welch recently was damaged by fire. It will be rebuilt.

SOMERSET, KY.—The Eastern Kentucky Light & Power Co. has been incorporated with $10,000 capital, by S. D. J. Dunlay, H. H. Gabbert and O. H. Dunlap.

CHATTANOOGA, TENN.—The Chattanooga Road & Machinery Co has purchased an abandoned building here which it will remodel for its own use. The building is three stories, 60 x 100 feet.

CHATTANOOGA, TENN.—The Arlington Stove Co. has been organized with $25,000 capital by C. C. Moore, J. D. Carlin, J. C. Lee, A. C. Carlin and John B. Hyde. The company will establish a plant for the manufacture of stoves and ranges.

HAMILTON COUNTY, TENN.—The Tennessee Machine Co. has been incorporated with $10,000 capital, by T. Pope Sheppard, E. H. Williams, L. Turney, T. W. Satterfield and Dan L. Fain.

KNOXVILLE, TENN.—William J. Oliver Mfg. Co.

will install steel furnaces and traction manufacturing equipment.

KNOXVILLE, TENN.—The William J. Oliver Mfg. Co. plans to improve its plant, by the construction of a steel foundry and the installation of additional machinery and equipment.

MEMPHIS, TENN.—Complete machine shops will be installed by the Southern Automobile Mfg. Co. Bids will be taken soon for a $250,000 plant and equipment. W. A. King, 117 Linden avenue, is president and general manager.

FAYETTEVILLE, N. C.—The foundry of the Carolina Machine Co. recently was damged by fire. The loss was estimated at $5000.

GASTONIA, N. C.—Michael & Bivens, machinists, will erect a building, 40 x 60 feet.

GREENSBORO, N. C.—The Cook-Lewis Foundry Co. has been incorporated with $50,000 capital, and will erect a plant, 40 x 75 feet. A. B. Lewis is manager.

KINSTON, N. C.—This city will erect an electric light plant at a cost of $300,000.

GREENVILLE, S. C.—The No-Name Razor Co. recently was incorporated with $10,000 capital, by D. B. Traxler and others.

PARIS, S. C.—The Cyclone Starter & Truck Co. has been incorporated with $1,000,000 capital, by Charles G. Eidson, W. L. Huchins, D. B. Traxler and others, and plans a plant.

ATLANTA, GA.—Drennon & Zahn contemplate the building of a forging and welding plant.

ATLANTA, GA.—The K. L. Jones Machinery Co. has purchased the plant of the Superior Motor Truck Co. A new building is being erected for the latter ncern.

HOMERVILLE, GA.—This city is planning an electric light plant.

SAVANNAH, GA.—The Chatham Iron & Metal Co. has filed a petition for incorporation with $10,000 captial. The incorporators are Samuel Tennenbaum and Louis Schoenberg.

ANNISTON, ALA.—The Eastham Soil Pipe & Foundry Co. recently was organized with $75,000 capital, by J. M. Eastham, O. J. Angle and M. S. Miller.

ANNISTON, ALA.—The Emory Foundry Co. has been organized with $100,000 capital, by H. B. Rudisill, W. C. Willson, W. A. Driver and Frank Morgan.

BIRMINGHAM, ALA.—The Welded Products Co. has purchased a site for a plant.

GADSGEN, ALA.—The A. & J. Mfg. Co. will establish a plant here for the manufacture of stoves. A building, 80 x 504 feet, will be erected.

GADSDEN, ALA.—Strigger Bros., Chicago, will establish a plant here for the manufacture of plumbers' supplies.

GADSDEN, ALA.—The Gulf States Steel Co. will spend $350,000 in the installation of a turbo-generator plant.

GADSDEN, ALA.—The Etowah Foundry & Machine Co. has been incorporated by W. T. Murphee, E. J. Owen, and C. P. Butcher.

EDWARDS, MISS.—This city is reported planning an electric light plant.

MERIDIAN, MISS.—The Perry Rotary Fixture Co. has been organized by Gus C. Kendall, R. L. Calvert, J. M. Perry and H. A. Gower.

BRONSON, FLA.—The Bronsom Mfg. Co. recently was organized to operate an electric light plant. I. P. Kimble is manager.

MIAMI, FLA.—G. M. Dykes plans a blacksmith shop.

BATON ROUGE, LA.—The Capital City Boiler Works, capitalized at $20,000, has been chartered to manufacture boilers and tanks by Theodore Dupre, Sylvester Bros. and W. P. Cornell.

IOTA, LA.—This city plans electric light and power plants.

Throughout the West

CLINTON, IOWA.—The Iowa Machine Works contemplates a foundry, 130 x 160 feet, to cost $60,000.

DAVENPORT, IOWA.—The Davenport Machine & Foundry Co. will erect a structural steel shop, 90 x 122 feet.

SIOUX CITY, IOWA.—Albertson & Co. are having plans drawn for a factory and machine shop, 2-stories, 65 x 150 feet, to cost $75,000.

MACON, MO.—This city plans an electric light plant, 1-story, 30 x 42 feet.

ST. LOUIS.—The Skinner Bros. Mfg. Co. contemplates a plant, 2-stories, 96 x 160 feet.

ST. LOUIS.—The American Bakers' Machine Co. plans a 2-story, 100 x 280-foot office and factory building, to cost $110,000.

ST. LOUIS.—The Lehman Machine Co., 606 South Broadway, will build a 2-story plant, 110 x 195 feet, costing $450,000.

ST. LOUIS.—The Western Tinware Co. has leased a 3-story building, to be devoted to the manufacture of electric washing machines.

ST. LOUIS.—The plant of the Copper Clad Malleable Range Co. recently was damaged by fire. It will be rebuilt.

SPRINGFIELD, MO.—The Springfield Machinery Co. has been organized with $30,000 capital, by J. W., B. L. and D. Adkins.

MARIANNA, ARK.—The People's Electric Co., M. D. Miller, president, will erect a building and install two boilers.

STAMPS, ARK.—The Stamps Light & Power Co. has been organized with $20,000 capital, by J. M. Hudgens, L. A. Baker and R. C. Stewart.

DALLAS, TEX.—The Western Gear & Parts Co. has been incorporated with $100,000 capital, by J. H. Connell, L. K. Weaver and E. F. Moser.

HOUSTON, TEX.—The Drilling Specialty Co. has been incorporated with $100,000 capital, by M. G. Lignoski, Fred Ankerman and others.

MONT BELVIEU, TEX.—The Mt. Belvieu Iron Works will erect a building, 30 x 60 feet, and install some equipment. The company was recently organized.

SAN ANTONIO, TEX.—The Travis Electric Co. has been incorporated with $10,000 capital, by Fred Kirsch, J. E. Smith and J. H. Cunningham.

SAN ANTONIO, TEX.—The Aluminum Honeycomb Co. has been incorporated with $25,000 capital, by A. M. Hassibauer, F. W. Briggs and Charlotte Strom.

WACO, TEX.—The Brazos Boiler Works, 1115 Mary street, has been organized with $50,000 capital, by L. E. Dillon, Z. McCormick and J. E. Simmans.

WICHITA FALLS, TEX.—William Holden plans to install a factory and machine shop.

GARBER, OKLA.—The Excel Tool Co. will erect a plant at a cost of $20,000.

McALESTER, OKLA.—The McAlester Electric Repair Co. has been incorporated with $5000 capital, by John Redpath, William Powell and C. J. Sample.

MUSKOGEE, OKLA.—The Oklahoma Engineering, Machine & Boiler Co. has been incorporated with $75,000 capital, by John Dunn and others.

TAFT, OKLA.—This city plans to install an electric light system.

TULSA, OKLA.—The Ragan Tank & Mfg. Co. will erect a building, 44 x 140 feet.

WILBURTON, OKLA.—An election will be held

(*Concluded on page 960*)

Business Changes Recently Announced

UNDER the firm name of the Fowler & Union Horse Nail Co., the Fowler Nail Co., Seymour, Conn., and the Union Horse Nail Co., Chicago, have been merged. As soon as its new plant is completed, the plants will be discontinued and operations concentrated at 1000 Military road, Buffalo. The Fowler company was established in 1865 and the Union Horse Nail Co. was established in 1874. Heretofore the companies have been operated separately but under the same control. For the present the Seymour, Conn., plant is being operated as the Fowler division and the Chicago plant as the Union division.

* * *

The Maher Engineering Co., 30 North Michigan boulevard, Chicago, has opened a branch office at 708 Schofield building, Cleveland, in charge of Lincoln E. Maher. This office will handle distribution of Erie Engine Works, engines, Dayton-Dowd Co., pumps, and Galland-Henning Mfg. Co., balers and presses.

* * *

John A. Stevens, 8 Merrimack street, Lowell, Mass., power plant engineer, has established a branch office at 502-4 Frederick building, 2063 East Fourth street, Cleveland.

* * *

Executive offices of the Rand Consolidated Mines, Ltd., producing iron and pyrite ores, with properties at Goudreau, Ont., recently were removed from Buffalo to the Farmers Bank building, Pittsburgh.

* * *

The Jeffrey Mfg. Co., Columbus, O., elevating, conveying, crushing and mining machinery, has opened a branch office in Los Angeles, in charge of F. R. Field.

* * *

The Yale & Towne Mfg. Co., formerly of New York, with a plant at Stamford, Conn., employing about 4000 workers, has moved its general offices to the latter city.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon — **Gross Tons Delivered to Consumer**

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$27.50 to 28.00
Chicago	25.00 to 26.25
Eastern Pennsylvania	25.00 to 25.50
Cleveland	25.00 to 26.00
St. Louis	24.00 to 24.50
Buffalo	25.00 to 25.50
New York (dealers)	22.00 to 22.50
Birmingham	24.00 to 25.00
Cincinnati	24.50 to 25.00
Valleys	26.50 to 27.00
Boston (dealers)	20.00 to 21.00
Detroit	22.00 to 22.50

BUNDLED SHEETS

Pittsburgh	$18.50 to 19.00
Eastern Pennsylvania	21.00 to 22.00
Cleveland	17.50 to 18.00
Buffalo	17.00 to 18.00
Cincinnati	18.00 to 19.00
St. Louis	14.00 to 14.50

STEEL RAILS, SHORT

Chicago	$29.00 to 29.50
Boston (dealers)	21.00 to 22.00
Cleveland	24.00 to 24.50
St. Louis	27.00 to 27.50
Birmingham	24.00 to 25.00
Cincinnati	24.00 to 25.00

STOVE PLATE

Pittsburgh	$33.00 to 34.00
Chicago	34.50 to 35.00
Eastern Pennsylvania	30.00 to 31.00
Cleveland	30.00 to 31.00
Detroit	31.00 to 31.50
St. Louis	32.50 to 33.00
Buffalo	32.00 to 33.00
New York	30.00 to 31.00
Birmingham	32.00 to 33.00
Cincinnati	28.00 to 28.50
Boston	26.50 to 27.50

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$32.00 to 32.50
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	32.00 to 33.00
Buffalo	32.00 to 33.00

SHOVELING STEEL

Chicago	$24.25 to 24.75
St. Louis	23.00 to 23.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$28.50 to 29.00
Chicago	27.50 to 28.00
St. Louis	26.50 to 27.00

BALED SHEETS

Pittsburgh	$23.50 to 24.00
Chicago	21.00 to 21.50
Detroit	19.00 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	$24.75 to 25.25
St. Louis	25.00 to 25.50
Eastern Pennsylvania	25.00 to 25.50

BOILER PLATE, CUT

Chicago, No. 1	$19.50 to 20.00
St. Louis	18.00 to 18.50

ANGLE BARS—STEEL

Chicago	$28.75 to 29.75
St. Louis	26.00 to 26.50

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$32.00 to 33.00
Pittsburgh, No. 2	27.50 to 28.00
Chicago, No. 1	31.50 to 31.75
Chicago, No. 2	28.00 to 28.50
Eastern Pennsylvania No. 1	35.00 to 36.00
Cleveland, No. 1	31.00 to 32.00
St. Louis, No. 1	28.50 to 29.00
St. Louis, No. 2	26.00 to 2650
Buffalo	33.00 to 34.00
Cincinnati	28.00 to 29.00
Birmingham, No. 1	22.50 to 24.00
New York, No. 1 (dealers)	32.00 to 32.50
Boston (dealers)	29.50 to 30.50

WROUGHT PIPE

Eastern Pennsylvania	20.00 to 21.00
Buffalo	21.00 to 22.00
New York (dealers)	22.00 to 22.50
Boston (dealers)	19.00 to 20.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$30.00 to 31.00

CITY WROUGHT

New York, long (dealers)	26.00 to 27.00

BUSHELING

Chicago, No. 1	$24.75 to 25.25
Chicago, No. 2	17.50 to 18.00
Cleveland, No. 1	22.00 to 22.50
Cleveland, No. 2	19.00 to 21.00
St. Louis, No. 1	24.00 to 24.50
Buffalo, No. 1	20.00 to 21.00
Cincinnati, No. 1	20.50 to 21.50
Eastern Pennsylvania, No. 1	24.00 to 25.00

MACHINE SHOP TURNINGS

Pittsburgh	$18.00 to 18.50
Chicago	15.50 to 16.00
Eastern Pennsylvania	19.50 to 20.50
Eastern Pennsylvania (Blast furn.)	18.50 to 19.50
Cleveland	15.00 to 16.00
Buffalo	16.50 to 17.00
New York (dealers)	17.00 to 17.50
St. Louis	16.00 to 16.50
Detroit	14.00 to 14.50
Cincinnati	14.00 to 14.50
Birmingham	16.0 to 17.00
Valleys	16.75 to 17.00
Boston (dealers)	16.00 to 17.00
Boston (blast furnace) (dealers)	14.00 to 15.00

CAST IRON BORINGS

Pittsburgh	$20.00 to 20.50
Chicago	15.50 to 16.00
Eastern Pennsylvania	21.50 to 22.50
Eastern Pennsylvania (chemical)	25.50 to 28.50
Cleveland	17.75 to 18.00
St. Louis	16.00 to 16.50
Detroit	16.50 to 17.00
Buffalo	18.00 to 18.50
New York (dealers' price)	18.50 to 19.00
Cincinnati	15.00 to 16.00
Birmingham	15.00 to 16.00
Valleys	19.75 to 20.00
Boston (dealers)	17.50 to 18.50
Boston (blast furnace) (dealers)	14.00 to 15.00

IRON AXLES

Pittsburgh	$45.00 to 46.00
New York (dealers)	46.00 to 47.00
Chicago	44.50 to 45.00
Eastern Pennsylvania	45.00 to 46.00
Detroit	41.00 to 42.00
Cleveland	42.50 to 43.00
St. Louis	42.00 to 42.50
Buffalo	40.00
Cincinnati	36.00 to 37.00
Birmingham	32.00 to 33.00

IRON RAILS

Chicago	33.50 to 34.00
Cleveland	30.00 to 31.00
St. Louis	33.00 to 33.50
Buffalo	28.00 to 29.00
Cincinnati	26.00 to 27.00

PIPES AND FLUES

Chicago	21.50 to 22.00
Cleveland	23.00 to 23.50
St. Louis	21.50 to 22.06
Cincinnati	21.00 to 21.50

GRATE BARS

Chicago	35.00 to 35.50
Cleveland	30.00 to 31.00
Detroit	22.50 to 23.50
Buffalo	24.00 to 25.00
New York	26.00 to 27.00
Eastern Pennsylvania	32.00 to 33.00

FORGE FLASHINGS

Cleveland, large	$17.75 to 18.25
Chicago, small	19.50 to 20.00
Cleveland, small	20.00 to 20.50
Boston (dealers)	15.00 to 16.00

FORGE SCRAP

Chicago	28.00 to 28.50
Eastern Pennsylvania, No. 1	21.00 to 22.00
Boston	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	36.50 to 37.00
St. Louis	36.00 to 36.50

ANGLE BARS—IRON

Chicago	35.50 to 36.00
St. Louis	34.00 to 34.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$22.50 to 23.00
Eastern Pennsylvania	22.00 to 23.00
Boston (dealers)	16.50 to 17.50
St. Louis	17.00 to 17.50
Detroit	16.50 to 17.00
Cleveland	22.50 to 23.00
Buffalo	21.00 to 22.00
Chicago	21.50 to 22.00

STEEL CAR AXLES

Pittsburgh	$35.00 to 36.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	35.00 to 36.00
St. Louis	36.50 to 37.00
Buffalo	40.00
Chicago	38.00 to 39.00
New York (dealers)	37.00 to 38.00
Birmingham	33.00 to 34.00
Boston (dealers)	28.00 to 29.00
Detroit	32.50 to 33.00

SHAFTING

Eastern Pennsylvania	36.00 to 38.00
St. Louis	33.50 to 34.00
New York (dealers)	31.00 to 32.00
Chicago	36.50 to 37.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$41.00 to 42.00
Pittsburgh, steel	28.50 to 29.00
Chicago, iron	38.00 to 38.50
Eastern Pennsylvania, iron	42.50 to 45.00
Cleveland, iron	36.00 to 37.00
St. Louis, iron	34.00 to 34.50
Buffalo, iron	37.00 to 38.00
Birmingham, iron	30.00 to 31.00
Birmingham, tram car	32.00 to 33.00
Boston	34.00 to 35.00
Cincinnati	30.00 to 31.00
New York, iron	36.00 to 37.00
Detroit	31.00 to 31.50

NO. 1 CAST SCRAP

Pittsburgh, cupola	$40.00 to 41.00
Chicago, cupola	42.75 to 43.25
Eastern Pennsylvania, cupola	40.00 to 41.00
Cleveland, cupola	39.00 to 40.00
New York, cupola (dealers)	38.50 to 39.50
Cincinnati, No. 1, machinery, cupola (net)	34.00 to 35.00
Detroit	34.00 to 34.50
Birmingham, cupola	32.00 to 33.00
St. Louis, railroad	39.00 to 39.50
St. Louis, agricultural	38.50 to 39.00
Buffalo	37.00 to 38.00
Boston	43.00 to 45.00
Valleys	38.00 to 39.00

HEAVY CAST

New York (dealers)	35.50 to 36.50
Buffalo	27.00 to 28.00
Pittsburgh	35.00 to 36.00
Cleveland	30.00 to 30.50
Boston	33.00 to 34.00

MALLEABLE

Pittsburgh, railroad	$31.00 to 32.00
Pittsburgh, agricultural	28.00 to 29.00
Chicago, railroad	33.50 to 34.00
Chicago, agricultural	33.50 to 34.00
Eastern Pennsylvania, railroad	30.00 to 32.00
Cleveland railroad	31.50 to 32.00
Cleveland, agricultural	27.00 to 28.00
St. Louis, railroad	28.00 to 28.50
St. Louis, agricultural	28.00 to 28.50
Cincinnati, railroad	28.00 to 29.00
Cincinnati, agricultural	28.00 to 29.00
Boston, railroad	27.50 to 28.50
Buffalo	31.00 to 32.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$35.00 to 36.00
Chicago	33.50 to 34.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	34.00 to 35.00
St. Louis	31.50 to 32.00
Birmingham	31.00 to 32.00
Boston (dealers)	30.00 to 30.50
Detroit	29.00 to 30.00

LOCOMOTIVE TIRES

Chicago	29.00 to 30.00
St. Louis	26.00 to 26.50

BOILER PUNCHINGS

Chicago	30.00 to 30.50
Eastern Pennsylvania	30.00 to 32.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

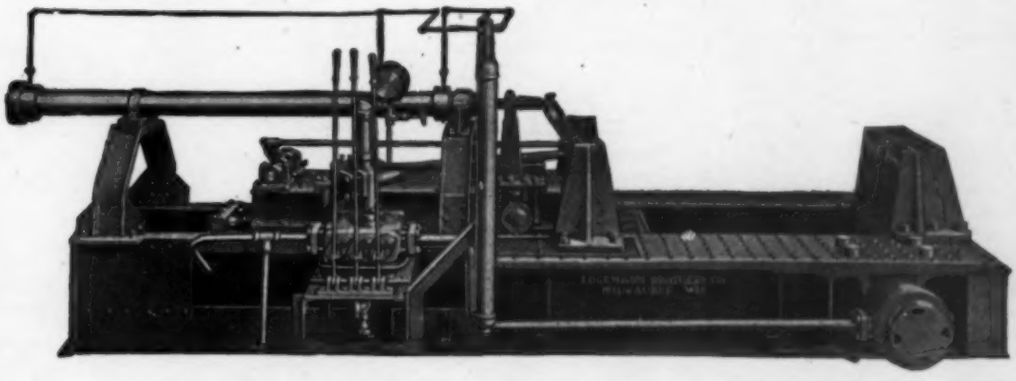
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

(*Concluded from page 957*)

soon on a $165,000 bond issue for waterworks improvements. V. V. Long & Co., consulting engineers. Stella Johnston, city clerk.

PITTSBURG, KANS.—The Pittsburg Boiler Works has let a contract for an addition.

ROSEDALE, KANS.—The Cleveland Steel Barrel Co., Cleveland, will build a plant, 80 x 290 feet and 45 x 80 feet, costing $80,000.

ABERDEEN, S. DAK.—The Aberdeen Light & Power Co. plans a boiler house, 2-stories, 40 x 45 feet, at a cost of $12,000.

FESSENDEN, N. DAK.—Plans are being prepared by T. R. Atkinson, engineer, Bismarck, for a waterworks and sewer system, costing $50,000.

NOXON, MONT.—Sanders county is planning a bridge containing four 210-foot steel riveted spans, costing $90,000.

EVERETT, WASH.—The Everett Steel Co. has purchased 11 lots on which it plans to erect additions to its plant.

SALEM, OREG.—The Enterprise Electric Co. contemplates the erection of a power house at an estimated cost of $150,000.

LOS ANGELES.—The Concrete Machinery Co. contemplates a 2-story plant, 99 x 120 feet, to cost $18,000.

LOS ANGELES.—The Atlas Machine Works, Inc., has been incorporated with $25,000 capital, by Charles Zimmerman, H. C. McManus and F. C. Wheeler.

LOS ANGELES.—The Atlas Machine Works, Inc., capitalized at $25,000, has been chartered to manufacture tools and machinery by F. C. Wheeler, Charles Zimmerman and H. C. McManus.

LOS ANGELES.—The Thermo-Electric Co., capitalized at $250,000, has been chartered to manufacture electrical apparatus by W. E. Tipton, Theodore Stensland and Frank L. Burns.

LOS ANGELES.—The Shehan Tool & Machine Co., 112 East Washington street, has been organized to manufacture machinery, tools, etc., by W. E. Shehan, 4265 South Hoover street, and others.

Business in Canada

GRES FALLS, QUE.—The Shawinigan Water & Power Co., 83 Craig street west, Montreal, Que., will construct a dam and build a power plant here. J. E. Aldred is president.

MONTREAL, QUE.—The plant and equipment of the Maisonneuve Foundry, 360 LaSalle street, has been purchased by Burnett & Crompton.

MONTREAL, QUE.—The Canadian Consolidated Rubber Co., 201 Inspecter street, will start work on factory buildings soon.

MONTREAL, QUE.—MacGovern & Co., Ltd., have been incorporated to manufacture electrical equipment, wire, machinery, etc., with $350,000 capital, by Maurice Dugas, Benjamine Robinson, Charles F. McCaffrey and others.

MONTREAL, QUE.—The Independent Steel Specialties Corp., Ltd., has been incorporated to manufacture iron, steel, castings, etc., with $250,000 capital, by William L. Davies, Alastair A. Gowan, Frank P. Turville and others.

RIGAUD, QUE.—The Northern Explosives, Ltd., has been incorporated to manufacture explosives, etc., with $1,500,000 capital, by George H. Sedgewick, room 1007, 36 Toronto street; John W. Pickup, 255 Glenlake avenue, and others.

SHERBROOKE, QUE.—The Sherbrooke Iron Works has been acquired by George L. Dourne and F. A. Schaff of New York, who will continue to operate under the name Sherbrooke Iron Works. Machinery will be installed in the plant for the manufacture of locomotives, marine and stationary superheating apparatus, as well as other steam specialties. In addition to the new work the company will continue to carry on a general foundry and machine shop business.

WINNIPEG, QUE.—The National Electric Products, Ltd., 83 Church street, Toronto, Ont., will build a 1-story oxygen plant.

WINNIPEG, QUE.—The Winnipeg Airco, Ltd., 408 Confederation Life building, will build hangars and workshops here.

AURORA, ONT.—J. Fleury's Sons, Wellington street, will start building operations soon on molding shop, etc.

BROCKVILLE, ONT.—B. Dillon, 43 King sreet east, has been appointed architect and is preparing plans for a foundry for Machinery & Foundries, Ltd., to cost $60,000.

DUNDAS, ONT.—The Public Utilities commission will construct waterworks extensions and additions to cost $48,000.

HAMILTON, ONT.—Adam Clark, Ltd., has been incorporated to manufacture stoves, furnaces, etc., with $250,000 capital, by William J. Clark, Alfred T. Harvey and others.

HANOVER, ONT.—Peppler Bros. Co., Ltd., have been incorporated by Joseph M. Bullen, 44 King street west; Norman S. Robertson, 1456 Davenport road, and others, with $150,000 capital, to manufacture furniture, iron and steel products, etc.

ISLINGTON, ONT.—The Etobicoke Township council is contemplating installation of waterworks plans and system here to cost $85,000. Clerk, Stephen Barratt, Islington.

KKITCHENER, ONT.—Malcolm & Hill, Ltd., have been incorporated to manufacture machinery, implements, tools, etc., by George H. Sproat, 55 Yonge street; Charles H. Kemp and others of Toronto.

NEWMARKET, ONT.—The Office Specialty Co., Timothy street, has purchased a site and will start work on a manufacturing plant. Harry C. Slemin, 97 Wellington street west, Toronto, Ont., is director.

ORILLIA, ONT.—The Canada Electric Castings, Ltd., has been incorporated to manufacture iron, steel, castings, etc., with $40,000 capital, by Burnett C. Lamble, James B. Tudhope and others.

TILBURY, ONT.—The Tilbury Brick & Tile Co., will rebuild its plant which was recently damaged by fire.

TORONTO, ONT.—The Walker Dishwashing Machinery Co., Syracuse, N. Y., is reported planning a plant here.

TORONTO, ONT.—The Coleman Lamp Co., Wichita, Kans., is said to have purchased a site here on which to erect a modern plant.

TORONTO, ONT.—The Prest-O-Lite Co. will build a plant and boiler house at an estimated cost of $400,000.

TORONTO, ONT.—Charles Hamilton, 232 St. Clements avenue, has had plans prepared for a garage and tin shop.

TORONTO, ONT.—The carriage factory owned by Coady Bros., 259 Queen street east, was damaged by fire. Plant will be rebuilt.

TORONTO, ONT.—The Semet-Solvay, Ltd., Syracuse, N. Y., has a site here and will start work soon on coke ovens. K. R. Marshall, Standard Fuel Co., 58 King street east, is local representative.

TORONTO, ONT.—The Page-Hersey Export Co., Ltd., has been incorporated to manufacture iron, steel, machinery, etc., with $100,000 capital, by Leo W. Goetz, John Sutherland, and others of Guelph, Ont.

TORONTO, ONT.—Wilson-McGovern, Ltd., have been incorporated by Henry H. Davis, 10 Adelaide street west; Lawrence A. Landriau and others with $100,000 capital, to manufacture machinery, supplies, tools, etc.

TORONTO, ONT.—The Ericson Marine & Aircraft Tool Co., Ltd., has been incorporated by Thomas L. May, 427 Queen street west; Harry A. Newman, 59 Victoria street; and others of Toronto, with $500,000 capital, to manufacture motors, machinery, tools, etc.

WALKERVILLE, ONT.—The Kales Stamping Co., Ltd., has been incorporated to manufacture sheet metal stampings, automobile parts, etc., with $50,000 capital, by William R. Kales, James T. Whitehead, Walter J. Leitheiser and others.

POINT GREY, B. C.—George Craddock & Co., Scotland, plans to erect a wire rope manufacturing plant here at an estimated cost of $100,000.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg., Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

A commercial agency firm in Belgium desires to purchase and secure an agency for the sale of machinery of all kinds, especially lathes, millers, planing machines, grinding machines, agricultural machinery, etc. Opportunity No. 32237.

A government department in one of the provinces of Canada desires to purchase complete equipment and supplies for lighthouses such as fog alarms, acetylene flashlights, bell buoys, etc. Opportunity No. 32240.

A firm of construction engineers in Norway desires to purchase about 50 tons of structural steel and iron in various sizes and thickness. Opportunity No. 32243.

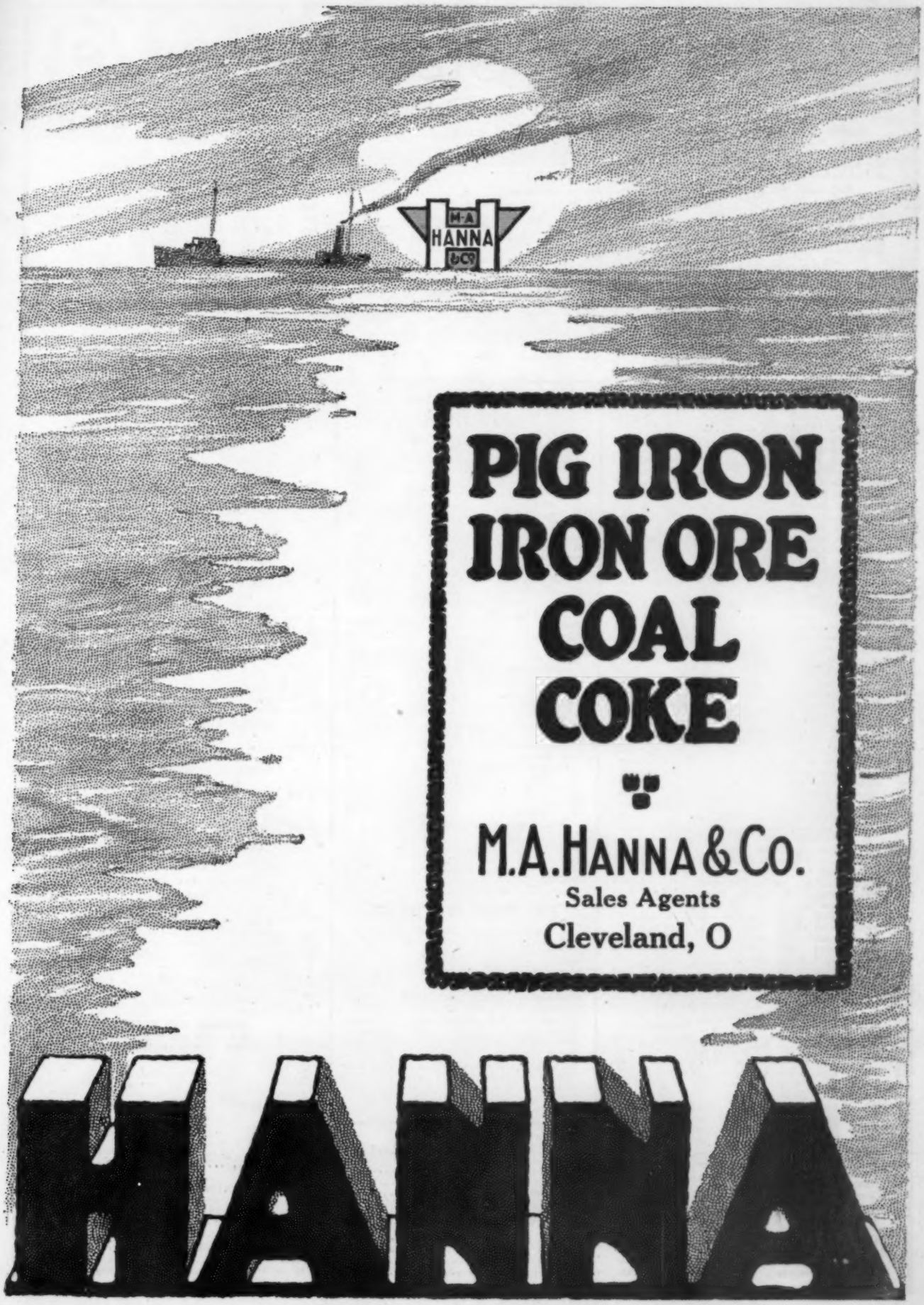
An importer in Portuguese East Africa desires to purchase and secure an agency for the sale of sawmill machinery, light motor lorries, railway material, engines, novelties and ironmongery. Opportunity No. 32280.

A military governor in a city of Syria desires to receive catalogs, price lists and discounts on American hand and steam plows, harrows, drills, mowers, reapers, rakes, thrashing machines, cleaning mills, etc. Opportunity No. 32286.

A shoemaker in Chili desires to purchase a machine for repairing shoes. Correspondence should be in Spanish. Opportunity No. 32290.

A coal mining company in Spain desires to purchase coal screening machinery, cableway, etc. Opportunity No. 32307.

A ranch owner in Mexico desires to purchase a first class farm tractor with plows and other machinery, as well as sawmill equipment. Opportunity No. 32317.


M-A
HANNA
& CO
PIG IRON
IRON ORE
COAL
COKE
M.A. HANNA & CO.
Sales Agents
Cleveland, O
HANNA

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$7.45
Mesabi Bessemer, 55 per cent iron	7.20
Old range nonbessemer, 51½ per cent iron	6.70
Mesabi nonbessemer, 51½ per cent iron	6.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$5.80
Old bed concentrates, 63 per cent	6.70
Harmony, cubbed, 63 per cent	6.70
New bed, low phos., 65 per cent	9.50
Lump ore for fix	7.00

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 60c to 70c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 60c per unit, nominal.

Caucasian, 48 to 50 per cent, f.o.b. cars, Atlantic ports, 60c to 65c per unit.

Warehouse Prices

Steel bars, Boston	4.75c
Steel bars, Chicago	3.37c to 3.87c
Steel bars, Cleveland	3.27c to 6.00c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.75c
Steel bars, New York	3.37c to 4.50c
Steel bars, St. Louis	3.94c
Steel bars, Cincinnati	4.50c
Steel bars, St. Paul	3.59c to 4.095c
Steel bars, Buffalo	4.06c
Iron bars, Boston	4.75c
Iron bars, Buffalo	4.76c
Iron bars, Chicago	3.87c to 4.25c
Iron bars, Detroit	4.085c
Iron bars, St. Louis	3.94c to 4.32c
Iron bars, Cincinnati	4.50c
Iron bars, Philadelphia	4.75c
Iron bars, New York	4.25c to 4.50c
Shapes, Chicago	3.47c to 3.97c
Shapes, Detroit	3.935c
Shapes, Boston	4.75c
Shapes, St. Louis	3.54c to 4.04c
Shapes, St. Paul	3.695c to 4.195c
Shapes, New York	3.47c to 4.25c
Shapes, Cleveland	3.37c to 5.10c
Shapes, Philadelphia	4.50c
Shapes, Buffalo	3.91c
Shapes, Cincinnati	4.10c to 4.25c
Plates, Buffalo	4.11c
Plates, Chicago	3.67c to 4.17c
Plates, Detroit	4.135c
Plates, Boston	5.30c
Plates, St. Louis	3.74c to 4.24c
Plates, St. Paul	3.895c to 4.395c
Plates, New York	3.67c to 5.00c
Plates, Cleveland	3.57c to 5.00c
Plates, Philadelphia	5.50c
Plates, Cincinnati	5.25c
No. 10 blue anl. sheets, N. Y.	6.12c to 6.50c
No. 10 blue anl. sheets, Phila.	6.50c
No. 10 blue anl. sheets, Chicago	4.57c to 6.02c
No. 10 blue anl. sheets, Cleveland	6.75c to 7.35c
No. 10 blue anl. sheets, Boston	6.30c
No. 10 blue anl. sheets, Buffalo	5.71c
No. 10 blue anl. sheets, St. L.	4.64c to 6.09c
No. 10 blue anl. sheets, Cincinnati	6.00c
No. 10 blue anl. sheets, St. Paul	4.79c to 6.245c
No. 10 blue anl. sheets, Detroit	5.485c
No. 28 black sheets, Chicago	5.62c to 7.00c
No. 28 black sheets, New York	7.50c to 8.25c
No. 28 black sheets, Phila.	7.50c
No. 28 black sheets, Cleveland	6.75c to 8.15c
No. 28 black sheets, Boston	8.15c
No. 28 black sheets, Cincinnati	8.50c to 9.00c
No. 28 black sheets, Detroit	6.75c
No. 28 black sheets, St. Louis	5.69c to 7.07c
No. 28 black sheets, St. Paul	5.845c to 7.225c
No. 28 black sheets, Buffalo	8.25c
No. 28 galv. sheets, Chicago	6.97c to 8.50c
No. 28 galv. sheets, New York	8.75c to 10.00c
No. 28 galv. sheets, Phila.	10.00c
No. 28 galv. sheets, Boston	9.50c
No. 28 galv. sheets, Cleveland	9.00c to 9.50c
No. 28 galv. sheets, Cincinnati	8.50c
No. 28 galv. sheets, Detroit	8.25c
No. 28 galv. sheets, Buffalo	9.50c
No. 28 galv. sheets, St. Louis	7.04c to 8.57c
Bands, New York	4.07c to 5.50c
Bands, Boston	6.25c
Bands, Detroit	4.785c
Bands, Buffalo	4.76c
Hoops, Buffalo	5.01c
Hoops, Boston	7.25c
Hoops, New York	5.57c
Hoops, Detroit	5.025c
Cold rolled shafting, Buffalo	5.50c to 6.00c
Sold rolled shafting, New York	6.00c to 7.50c
Cold rolled shafting, Boston	6.25c
Cold rolled flats, squares and hexagons, New York	6.50c to 7.50c
Cold rolled rounds	5.50c

Mill Sheet Schedule

BLACK

Differentials for gage, per 100 pounds

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90

Virginia furnaces to:

Philadelphia	4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	$4.30

Chicago to:

Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	25.0 cents
Boston	30.0 cents
Buffalo	21.0 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

GALVANIZED AND LONG TERNE

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	+15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 13-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

BLUE ANNEALED

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Pittsburgh basing discounts to jobbers in carloads

Steel Pipe

STANDARD WEIGHT

	Black	Galvanized
Butt Weld		
⅛, ¼ and ⅜-inch	47 to 50½	20½ to 24
½-inch	51 to 54½	36½ to 40
¾ to 3-inch	54 to 57½	40½ to 44
Lap Weld		
2-inch	47 to 50½	34½ to 38
2½ to 6-inch	50 to 53½	37½ to 41
7 to 12-inch	47 to 50½	33½ to37
13 to 14-inch	37½ to 41	
15-inch	35 to 38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	52 to 55½	38½ to 42
2-inch	45 to 48½	32½ to 36
Lap Weld		
2½ to 6-inch	48 to 51½	35½ to 39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch	43 to 46½	25½ to 29
½-inch	48 to 51½	35½ to 39
¾ to 1½-inch	52 to 55½	39½ to 43
2 to 3-inch	53 to 56½	40½ to 44
Lap Weld		
2-inch	45 to 48½	33½ to 37
2½ to 4-inch	48 to 51½	36½ to 40
4½ to 6-inch	47 to 50½	35½ to 39
7 to 8-inch	43 to 46½	29½ to 33
9 to 12-inch	38 to 41½	24½ to 28

DOUBLE EXTRA STRONG PLAIN

Butt Weld		
½-inch	39 to 42½	28½ to 32
¾ to 1½-inch	42 to 45½	31½ to 35
2 to 2½-inch	44 to 47½	33½ to 37
Lap Weld		
2-inch	37 to 40½	27½ to 31
2½ to 4-inch	39 to 42½	29½ to 33
4½ to 6-inch	38 to 41½	28½ to 32
7 to 8-inch	33 to 36½	19½ to 23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

	Black	Galv.
Butt Weld		
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½
Lap Weld		
2-inch	28½	14½
2½ to 6-inch	30½	17½
7 to 12-inch	27½	14

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼-inch	+21	+36
⅜-inch	28½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½
Lap Weld		
2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½

DOUBLE EXTRA STRONG PLAIN ENDS

	Black	Galv.
Butt Weld		
½-inch	15½	3½
¾ to 1½-inch	20½	8½
Lap Weld		
2-inch	16½	4½
2½ to 4-inch	18½	9½